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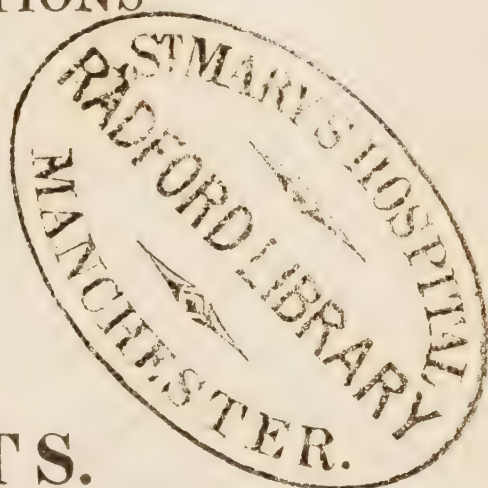
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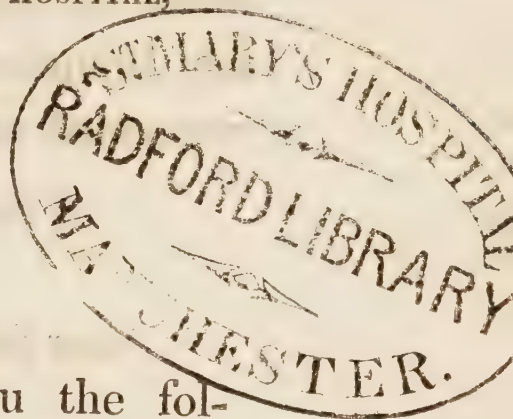
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SENIOR SURGEON TO ST. GEORGE'S HOSPITAL,

&c. &c. &c.

DEAR SIR,

IN dedicating to you the following observations, I am anxious to avail myself of the first opportunity, which has occurred, of publicly expressing my gratitude for the numerous favours, which I have received from you, from the time of my first commencing my professional pursuits; and of acknowledging the obligations, which I owe, to your example, to your instructions, and



to your friendly assistance, on many and various occasions.

Independently of these private considerations, I should have been desirous of prefixing your name to this volume, as a mark of my respect for one, whose talents and unwearied exertions have so essentially contributed to the advancement of surgery, and of those interesting branches of philosophy, which are connected with it.

I remain,

Dear Sir,

Your faithful friend and servant,

B. C. BRODIE.

Sackville Street,
October 19. 1818.

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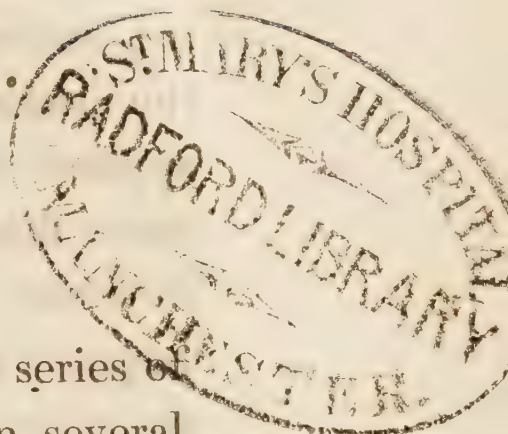
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INTRODUCTION.

THE following pages contain a series of observations, which were begun several years ago, and which have been continued, not without considerable labour, up to the present period. They relate to a class of diseases, which have strong claims on the attention of the surgeon ; since they are of very frequent occurrence ; are a source of serious anxiety to the patients ; and, for the most part, if neglected, proceed to an unfavourable termination. There are other circumstances also, which seemed to render the morbid affections of the joints a fit subject of investigation. They have scarcely met with the attention, which they merit from former pathologists. The terms, white swellings, scrophulous joints, &c. have



been used without any well-defined meaning, and almost indiscriminately ; so that the same name has been frequently applied to different diseases, and the same disease has been distinguished by different appellations. Confusion with respect to diagnosis always gives rise to a corresponding confusion with respect to the employment of remedies ; and hence I was induced to hope, that, if it were possible to improve our pathological knowledge of the diseases to which I have alluded, this might lead, not indeed to the discovery of new methods of treatment, but to a more judicious and scientific application of those which are already known, and a consequent improvement of surgical practice.

The joints, like the other animal organs, are not of a simple and uniform, but of a various and complicated structure. Although in the advanced stages, the diseases, to which they are liable, extend to

all the dissimilar parts of which they are composed, it is to be presumed that such is not the case in the beginning. We cannot doubt, that here, as elsewhere, the morbid actions commence, sometimes in one, and sometimes in another texture; and that they differ in their nature, and are variously modified, and of course require to be differently treated, according to the mechanical organization, and the vital properties of the part, in which they originate.

It was under the influence of these impressions that I endeavoured to pursue my enquiries into the subject of the present treatise. Believing, that, nothing has contributed in a greater degree towards the modern improvements in surgery, than the practice of investigating by dissection the changes of anatomical structure, which disease produces, I availed myself of every opportunity which occurred of making such examinations. In particular, I was anxious to do this, where

the morbid changes were still in an early stage, and where I had the opportunity of noting the symptoms by which the incipient disease was indicated ; and the knowledge which was thus acquired became the basis of my future observations. In laying the results before the public, I cannot be otherwise than conscious, that these researches are still imperfect. But I feel assured, at the same time, that those who are engaged in the study of pathology, will make due allowance for the difficulties, which belong to this most complicated of all the sciences, and will not be disposed to criticise my labours severely, because they find, that there is still an ample space left for those, who may be willing to engage in similar enquiries.

Some of my readers will recognize in the present work the substance of some papers, which were published in the fourth and two subsequent volumes of the Medico-Chirurgical Transactions ; but

they will also find a considerable proportion of new matter. I have met with no reasons for altering my former arrangement of those affections of the joints which are of most frequent occurrence. Indeed it has been to me a source of much satisfaction, that all my subsequent observations, founded on numerous additional cases and dissections, have tended to confirm the accuracy of those pathological views, which I was led to adopt several years ago, and which I ventured to bring forward in the first of those papers, to which I have alluded.

CHAP. I.

ON INFLAMMATION OF THE SYNOVIAL MEMBRANES OF JOINTS.

SECT. I.

Pathological Observations.

THE soft parts, which, added to the bones and cartilages, constitute the structure of the joints, are, the synovial membranes by which the lubricating fluid is secreted; the ligaments, by which the bones are connected to each other; and the fatty substance, which occupies what in certain positions would otherwise be empty spaces. It is to be supposed, that the adipose membrane belonging to the joints may be inflamed; that it may be the seat of abscesses and tumours, as well as that which is situated beneath the skin or in the interstices of the muscles; and the

ligaments cannot be regarded as more exempt from disease than the fibrous membranes, which they very nearly resemble in their texture. It is not improbable that the pains and slight tumefactions of the joints, which occasionally take place in syphilitic affections, may depend on some diseased action of the ligaments; and there can be little doubt that the long-continued symptoms, which sometimes follow a severe sprain, depend on these same parts being in a state of slow inflammation, in consequence of some of their fibres being ruptured, or over-stretched. I cannot say that I have never seen a case, where disease, independently of these causes, has originated in the ligaments; but I certainly have never met with a case, where it has been proved to have done so, by dissection; and it may be safely asserted, that this is a rare occurrence, and not what happens in the ordinary diseases to which the joints are liable.

On the other hand, no part of the body is much more frequently diseased than the synovial membranes. This is what their anatomical structure and functions might lead us to expect, since we find that living organs are more subject to have their natural functions deranged, in proportion as they are more vascular, and as they are employed in a greater degree in the process of secretion.

The synovial membranes of the joints have not been well described by the majority of the old, nor even of modern anatomists. A sufficiently accurate account of it has been published by Dr. W. Hunter, in a communication to the Royal Society on the structure of cartilage, published in the forty-second volume of the Philosophical Transactions, and since then by M. Bichat, in his *Traité des Membranes*; and to these authors I may refer those of my readers, who wish to see its anatomy more fully explained. At present it is sufficient for me to observe, that

its office is to secrete the synovia, by which the joints are lubricated; that it lines the ligaments, by which the bones are held together; covers the bones themselves for a small extent, taking the place of the periosteum; and that from thence it passes over the cartilaginous surfaces, and the inter-articular fat. Where it adheres to the bones and soft parts, it very much resembles the peritonæum in its structure, and possesses considerable vascularity; but where it is reflected over the cartilages it is thin, and readily torn;—its existence, however, even here, may be always distinctly demonstrated by a careful dissection. The synovial membrane of a joint forms a bag, having no external opening; in this respect resembling the peritonæum, the pleura, and the pericardium; which it also resembles in its functions, and to which it bears some analogy in its diseases.

Cases occasionally (but not often) occur, in which a joint is swollen from a pre-

ternatural quantity of fluid collected in its cavity, without pain or inflammation. This may be supposed to arise, either, from a diminished action of the absorbents, or an increased action of the secreting vessels. The disease may be compared to the dropsy of the peritonæum, or pleura; or, more properly, to the hydrocele; and it has been not improperly designated by the terms, “*Hydarthrus*,” and “*Hydrops articuli*.”

It more frequently happens that there is swelling from fluid in a joint with inflammation and pain. Here we may presume that the disease consists in an inflammation of the synovial membrane, with a consequent increase of the secretion from its surface; and this is confirmed by the appearances observed in those cases, in which there is an opportunity of examining the affected parts after death.

In many instances, while there is still pain and inflammation in the joint, the

fluid is felt indistinctly, as if a considerable mass of soft substance lay over it. Often, when the inflammation has subsided, and the fluid is no longer to be felt, the joint remains swollen and stiff; painful, when bent or extended beyond a certain point, and liable to a return of inflammation from slight causes. The appearances observed in the following cases, in which there was an opportunity of examining the effects which the disease had produced, seem to throw light on this subject.

CASE I.

A middle-aged man was admitted into St. George's Hospital in September 1810, on account of a disease in one knee. The joint was swollen and painful, with slight stiffness, and with fluid in its cavity. The swelling extended some way up the anterior part of the thigh, behind the lower portion of the extensor

muscles. It subsided under the use of blisters and liniments. Two months after his admission into the hospital, he was seized with a fever, apparently unconnected with the disease in the knee, of which he died. On examining the affected joint, the synovial membrane was found much diseased, and more capacious than natural, extending up the anterior surface of the femur at least an inch and a half higher than usual. Throughout the whole of its internal surface, except where it covered the cartilages, the membrane was of a dark red colour; the vessels being as numerous, and as much distended with blood, as those of the tunica conjunctiva of the eye in a violent ophthalmia. At the upper and anterior part of the joint, a thin flake of coagulable lymph was effused from the inner surface of the synovial membrane, of the size of a half-crown piece. There was no other appearance of disease, except that at the edge of one

of the condyles of the femur the cartilage adhered to the bone less firmly than usual.

CASE II.

A. B., a young man, in the spring of the year 1808, in consequence (as he supposed) of exposure to damp and cold, became affected with a painful swelling of one of his knees. Under the treatment employed by the practitioner whom he consulted, the pain and swelling in great measure, but not entirely, subsided. Three months after the disease first took place, he was admitted into St. George's Hospital. At this time the knee was swollen, painful, and tender. The swelling had the form of the articulating ends of the bones. The leg was confined to nearly the straight position, and admitted of very little motion on the thigh. His general health was unaffected.

Blood was taken from the knee by cupping; and afterwards it was rubbed daily with mercurial ointment and camphor. The pain and inflammation subsided; and the swelling and stiffness were in some measure lessened. It afterwards became necessary to amputate the limb on account of another disease. The operation was performed on the 15th of December 1808, and I did not neglect the opportunity of examining the joint.

The bones, cartilages, and ligaments, were in a natural state. The synovial membrane was increased in thickness to about one-eighth of an inch, and was of a gristly texture. It was closely attached to the surrounding cellular membrane and fascia by means of coagulable lymph, which had been formerly effused on its external surface.

These cases seem to explain the usual consequences of inflammation of the sy-

novial membrane. It occasions, 1st, a preternatural secretion of synovia ; 2dly, effusion of coagulable lymph into the cavity of the joint ; 3dly, in other cases a thickening of the membrane ; a conversion of it into a gristly substance ; and an effusion of coagulable lymph, and probably of serum, into the cellular texture, by which it is connected to the external parts.

I have seen several cases where, from the appearance of the joint, and other circumstances, there was every reason to believe that the inflammation had produced adhesions, more or less extensive, of the reflected folds of the membrane to each other ; and I have observed occasionally in dissection such partial adhesions as might reasonably be supposed to have arisen from inflammation at some former period.

These effects of inflammation of the synovial, very much resemble those of inflammation of the serous membranes. There are however some points of dif-

ference. In the latter, it is not very uncommon for suppuration to take place independent of ulceration. I have had an opportunity of examining one case, where the same thing had occurred in the synovial membrane of a joint. The elbow was found filled with pus, although there was no ulcerated surface. Here the inflammation followed a small wound, which had penetrated into the articular cavity; but I believe that inflammation of the synovial membranes, which has not had its origin in mechanical injury, seldom terminates in this manner. Inflammation of the peritonæum or pleura, though very slight in degree, and of short duration, is sufficient to produce an effusion of coagulable lymph; but it is only violent or long-continued inflammation which has the same result in the membranes of the joints.

The slight adhesion of the cartilage to the bone in one of the cases which have

been related, we must suppose to have proceeded from the greater disease in the synovial membrane. I shall have occasion hereafter to remark, that the same thing may sometimes be observed, where the cartilage is about to ulcerate. I have known some cases, in which there was extensive destruction of the cartilages of a joint, and which, from the previous history and symptoms, seemed to have been the consequence of neglected inflammation of the synovial membrane. That this should happen is no more remarkable, than, that ulcer of the cornea should occasionally be induced by inflammation of the *tunica conjunctiva* of the eye. At the same time, I believe it will be found in the great majority of cases, where ulceration of the cartilages is combined with inflammation of the synovial membranes, that the former is the primary affection, and that the latter takes place subsequently in consequence of the formation of an abscess in the articular cavity.

SECT. II.

On the Causes and Symptoms of this Disease.

It is evident that inflammation may affect the synovial membrane of a joint, by extending to it from some of the other textures of which the joint is composed, or that it may have its origin in the membrane itself. My present observations are intended to relate chiefly to cases of the latter description; and what little is to be said in addition respecting those of the former, will be better introduced hereafter.

Although no period of life is altogether exempt from this disease, it does not occur equally in persons of all ages. It very seldom attacks young children; becomes less rare as they approach the age of puberty; and is very frequent in adult persons. This is the reverse of what

happens with respect to some of the other diseases, to which the joints are liable, and a knowledge of these circumstances will be found of some importance to the surgeon, in assisting him to form a ready diagnosis.

Inflammation of the synovial membranes may take place, as a symptom of a constitutional affection, where the system is under the influence of rheumatism ; where mercury has been exhibited improperly, or in too large quantities ; and under a variety of other circumstances. But, in these cases, the disease for the most part is not severe ; it occasions a preternatural secretion of synovia ; but does not in general terminate in the effusion of coagulable lymph, or in thickening of the inflamed membrane. Sometimes it attacks the greater number of the joints at the same instant, and even extends to the synovial membranes, which constitute the bursæ mucosæ and sheaths of the tendons. At other times it leaves

one part to attack another, and several joints are affected in succession.

In other cases, the disease is entirely local; produced by a sprain or other injury; or the application of cold; and sometimes arising from no evident cause. The application of cold is, on the whole, the most frequent source of the complaint; and hence it is easy to explain, why it occurs much more frequently in the knee than in any other joint; and why it is rare in the hip and shoulder, which are defended by a thick mass of muscles from the influence of the external temperature. Where the inflammation is thus confined to a single joint, it is more probable that it will assume a severe character; and that it may be of long duration. It leaves the joint with its functions more or less impaired; and occasionally terminates in its total destruction. In itself it is a serious disease, but it is often confounded under the alarming name of white swelling, with other diseases, which are still more serious.

Inflammation may attack the synovial membranes in different degrees of intensity ; but for the most part it has the form of a chronic or slow inflammation ; which, while it impairs, does not altogether destroy the functions of the joint ; and which, if not relieved in the first instance by active and judicious treatment, may, like a chronic ophthalmia, continue for weeks or months, and with occasional recoveries and relapses may even harass and torment the patient during several successive years.

In the first instance, the patient experiences pain in the joint, which although it affects the whole articulation, is often referred principally to one spot, where it is felt more severely than elsewhere. The pain usually continues to increase during the first week or ten days, when it is at its height. Sometimes even at this period the pain is trifling, so that the patient experiences but little inconvenience from it ; at other

times it is considerable, and every motion of the joint is distressing and difficult.

In the course of one or two days after the commencement of the pain, the joint may be observed to be swollen. At first, the swelling arises entirely from a preternatural collection of fluid in its cavity. In the superficial joints, the fluid may be distinctly felt to undulate, when pressure is made alternately by the two hands placed one on each side. When the inflammation has existed for some time, the fluid is less perceptible than before, in consequence of the synovial membrane having become thickened, or from the effusion of lymph on its inner or outer surface; and in many cases, where the disease has been of long standing, although the joint is much swollen, and symptoms of inflammation still exist, the fluid in its cavity is scarcely to be felt. As the swelling consists more of solid substance, so the natural mobility of the joint is in a greater degree impaired.

The form of the swelling deserves notice. It is not that of the articulating ends of the bones, and therefore it differs from the natural form of the joint. The swelling arises chiefly from the distended state of the synovial membrane, and hence its figure depends in great measure on the situation of the ligaments and tendons, which resist it in certain directions, and allow it to take place in others. Thus, when the knee is affected, the swelling is principally observable on the anterior and lower part of the thigh, under the extensor muscles, where there is only a yielding cellular structure between those muscles and the bone. It is also often considerable in the spaces between the ligament of the patella and the lateral ligaments; the fluid collected in the cavity causing the fatty substance to protrude in this situation, where the resistance of the external parts is less than elsewhere. In the elbow the swelling

is principally observable in the posterior part of the arm, above the olecranon, and under the extensor muscles of the fore-arm; and in the ankle it shews itself on each side, in the space between the lateral ligaments, and the tendons, which are situated on the anterior part. In like manner in other joints, the figure of the swelling, whether it arises from fluid alone, or joined with solid substance, depends in great measure on the ligaments and tendons in the neighbourhood, and on the degree of resistance which they afford; and these circumstances, though apparently trifling, deserve our attention, as they enable us more readily to form our diagnosis.

In the hip and shoulder the disease occurs less frequently than in the superficial joints. The effused fluid here cannot be felt to undulate, but the swelling is perceptible through the muscles. When the hip is affected, in the first instance a tumefaction may be observed in the groin

and in the nates also ; but where the disease has existed for some time, the nates assume a flattened appearance, in consequence of the glutæi muscles becoming wasted from want of use. The pain is usually confined to the hip itself ; but I have known some cases, in which it was referred to the knee also. These symptoms to a certain degree correspond to those which take place where the cartilages of the hip are ulcerated ; but attention to the following circumstances will enable us to distinguish the two diseases from each other. Where the synovial membrane of the hip is inflamed, the pain is more severe in the beginning than in the advanced stage of the disease, and it never amounts to that excruciating sensation, which exhausts the powers and spirits of the patient, who labours under the other affection : the pain is aggravated by motion, but not by pressing the cartilaginous surfaces against each other ; so that it does not prevent the weight of

the body being supported on the affected limb; and the wasting of the glutæi muscles is preceded by a swollen appearance of the nates.

After inflammation of the synovial membrane has subsided, the fluid is absorbed, and in many instances the joint regains its natural figure and mobility; but in the majority of cases, stiffness and swelling remain. Sometimes the swelling has the same peculiar form, which it possessed while the inflammation still existed, and while fluid was contained in the joint; and we may suppose, that it depends principally on the inner surface of the synovial membrane having a thick lining of coagulable lymph: at other times the swelling has the form of the articulating extremities of the bones, that is, nearly the natural form of the joint, and it probably arises from the thickened state of the synovial membrane. From whichever of these causes a swelling remains after the inflammation has subsided, the

patient is very liable to a recurrence of the disease. Whenever he is exposed to cold, or exercises the limb in an unusual degree, and often, without any evident reason, the pain returns, and the swelling is augmented. In those cases, where the synovial membrane is thickened, although the fluid which had been effused is absorbed, and the principal swelling has disappeared, it occasionally happens not only that a certain degree of inflammation still lingers in the part, but that it continues until the morbid action extends to the other textures; and ultimately ulceration takes place in the cartilages, suppuration is established, and there is complete destruction of the articulating surfaces. In this advanced stage, if we wish to know whether the inflammation of the synovial membrane, or the ulceration of the cartilages, has been the primary affection, we must form our judgment, not from the present symptoms, but from the previous history

of the case. It is indeed, often difficult to procure a history on the accuracy of which we can rely, particularly in hospital practice; but this is of the less importance, as whatever the disease may have been in its origin, where it has proceeded so far as has been described, there is no difference respecting the treatment; and for the most part, when suppuration has taken place, there is little prospect of advantage from any thing, except the removal of the limb by amputation.

I believe, that the above history will be found applicable to the majority of cases, in which this disease exists. But I have before observed, that inflammation may affect the synovial membranes in different degrees of intensity; and occasionally it will be found to be more urgent in its symptoms, and to be more rapid in its progress, than what has been described; having the characters of an acute instead of a chronic inflammation. Under these circumstances, the swelling

takes place immediately after, or at the same instant with, the first attack of pain; there is redness of the skin; the pain is more severe, and it is so much aggravated by the motion of the parts, that the patient keeps the joint constantly in the same position, and usually, in an intermediate state, between that of flexion and extension. In addition to these symptoms there is more or less of symptomatic fever of the inflammatory kind. In a few days the disease, if left to itself, assumes the chronic form; or perhaps, under proper treatment, it subsides altogether.

It must be observed, however, that the boundaries of acute and chronic inflammation do not admit of being very well defined. These terms accurately enough express the two extremes; but there are numerous intermediate degrees of inflammation, of which it is difficult to determine, whether they should be considered as being of the acute or chronic kind. On

this and on many other occasions the pathologist must be content, if he can succeed in pointing out the principal varieties of morbid action which occur, and the symptoms, which they produce, in such a manner as will enable others, with the assistance of a certain degree of original observation, to distinguish those nicer shades in the characters of disease, which language is inadequate to explain, but a knowledge of which is of considerable importance in medical and surgical practice.

SECT. III.

On the Treatment of this Disease.

IN those cases, in which inflammation of the synovial membrane has arisen from a protracted, or ill-conducted course of mercury, sarsaparilla may be given with some advantage, although it does not exhibit those singular powers which it is known to possess in some other com-

plaints, which spring from the same source. When the inflammation is connected with rheumatism, opium conjoined with diaphoretics, preparations of the colchicum autumnale, and such other remedies, may be employed, as are capable of relieving rheumatism in other textures. In some other instances, when several joints have been affected at the same time, it has appeared to me that the patient has derived benefit from the use of moderate doses of some mercurial preparation.

The principal remarks, however, which I have to make at present, relate to the local treatment of the disease; and it is worthy of notice, that even in those cases where it is evidently dependent on some constitutional affection, topical remedies are on the whole of more importance than any other.

In the acute form of the inflammation leeches may be applied in the neighbourhood of the part; and if there is much

symptomatic fever, blood may be taken from the arm, and the bleeding may, or may not, be repeated according to circumstances. Attention should be paid to the state of the bowels, and saline draughts may be given with some diaphoretic medicines. If the swelling has rapidly risen to such a height, as to occasion considerable tension of the soft parts, the pain will be best relieved by means of warm fomentations and poultices; but otherwise cold evaporating lotions seem to produce a better effect. Under this treatment the acute inflammation in general speedily subsides.

The chronic inflammation is relieved more slowly. In the first instance the joint should be kept in a state of perfect quietude. Blood should be taken from the part, by means of leeches or cupping. It has appeared to me, that the latter method is preferable; the sudden abstraction of blood, which can be thus effected, being more beneficial than the

more gradual hæmorrhage, which is procured by leeches. It will in general be right to repeat the blood-letting twice or three times, or even oftener; and in the intervals compresses may be laid on the part, moistened with some cold lotion. After the violence of the inflammation is subdued, a blister may be applied; and (if necessary) several blisters may be used in succession, with more advantage than a single blister kept open by means of savine cerate. The blisters should be of a considerable size; and if the affected joint be deep-seated, they may be applied as near to the joint as possible; but otherwise a blister is frequently of more service when applied at a little distance. For example, if the synovial membrane of the hip be inflamed, the blister may be placed on the groin and nates; but if the disease be in the wrist, it may be applied to the lower part of the fore-arm. Under this treatment the pain is usually relieved, and in a few days the swelling, as far as

it depends on fluid collected in the joint, is much diminished. Even when the tumor is solid, arising from the effusion of coagulable lymph, it will in a considerable degree subside, and sometimes be entirely dispersed, provided that the lymph has not yet become organized. Blisters are of more service, with respect to the removal of the swelling, than any other remedies; but they should not be employed without the previous abstraction of blood, except when the inflammation is slight, and when fluid is effused without any admixture of solid substance.

When the inflammation is in great measure relieved, a moderate degree of exercise of the joint is beneficial, rather than otherwise. Liniments, which irritate the skin, may be rubbed on twice or three times in the day. The liniments of the Pharmacopœia are not sufficiently stimulating for this, nor indeed for most other purposes. The *linimentum saponis*, or *linimentum cam-*

phoræ compositum, may be made stronger by the addition of *liquor ammoniæ* and *tinctura lyttæ*; and the powers of the *linimentum ammoniæ* may be augmented in the same manner, or by the addition of the *oleum terebinthinæ*. The following liniment is more stimulating than those in common use, and seems to me in many cases to be productive of much better effects with respect to the disease.

R *Olei Olivæ* ℥ jfs.

Acidi Sulphurici ℥ ℞.

M. *Fiat linimentum.*

It may be used of this strength for the class of persons who apply at a hospital for relief; but for those of a higher class in society, in whom the cuticle is generally thinner, and the cutis more tender, the proportion of olive-oil should be greater. The effect of this liniment is to excite some degree of inflammation of the skin: the cuticle becomes of a brown colour, and separates in thick, broad scales; and the

inflammation of the internal parts is relieved, probably on the same principle as by a blister. Another liniment, which is also very useful, is one frequently recommended, consisting of a dram (or more) of the *antimonium tartarisatum* to an ounce of the *unguentum cetacei*. This produces a pustular eruption of the skin, which, like other eruptions of the same kind, runs its course, and during a certain period of time operates very beneficially by abstracting the inflammation from the other parts.

No other remedies seem to be productive of much benefit.

Plasters of gum ammoniac, and others of a similar nature, are of little efficacy, while inflammation still exists ; but afterwards they are sometimes of use in protecting the joint from the influence of the external cold, and preventing a relapse.

Issues and setons are of no service, except, when there is reason to believe that a secondary disease has begun to

take place, in the form of ulceration of the cartilages ; and of their use, under these circumstances, I shall have occasion to speak hereafter.

The swelling and stiffness, which remain after the inflammation has subsided may be relieved by the free exercise of the limb, and by friction. The mercurial ointment with camphor may be rubbed on the joint ; or friction may be made by the hand, with starch or other fine powder. The friction, however, should be employed with caution, as, when used too freely, it sometimes occasions a return of the inflammation. Whenever there is the slightest indication of this being the case, the friction should be omitted, blood should be taken from the part, and some time should elapse before the friction is resumed. Friction is sometimes productive of very essential benefit, but not unless it be employed to a considerable extent ; as for two or three hours daily, and during a long period of time.

As, however, when employed in this manner, it is likely to induce a return of inflammation in parts in which the inflammatory disposition may still linger, it evidently is a remedy, which is applicable only under certain circumstances. For these reasons it is that friction appears to be more efficacious where the stiffness of a joint depends on a contracted state of the muscles or tendons of the limb, and on these being glued to each other, and to the surrounding parts, than where it is the consequence of disease in the joint itself.

I have sometimes tried the effect of pumping hot water on a stiff joint, as recommended by Le Dran, and as now practised at some watering places. The blow of a column of water, falling from a height of several feet, produces considerable friction, even so as to excoriate the surface, with which are combined the relaxing powers of heat and moisture. This practice is certainly productive of

benefit; but the observations just made apply to this as well as the other modes of producing friction.

SECT. IV.

Cases of Inflamed Synovial Membrane.

THE cases which I am about to relate, will serve to illustrate some of the observations respecting the inflammation of the synovial membrane, which I have already made; and also to explain some circumstances, which will be found to occur in practice, and which could not so well be introduced in the general history of the disease, contained in the preceding pages. Whoever will take the pains to compare these cases with each other, and with those which I shall relate hereafter, will, if I am not exceedingly mistaken, be convinced, that the distinction of the different diseases of the joints is not a mere matter of curiosity, which may be

interesting to the morbid anatomist ; but that these diseases are different in their progress ; that they produce different symptoms, by which they may be known from each other in the living person ; and which indicate the employment of different remedies, for their relief.

CASE III.

John Adams, forty-seven years of age, on the 21st of August, 1811, was seized with a pain in his left knee, and in the course of a few hours he found the joint to be swollen. This was accompanied by a slight attack of fever.

On the 28th of August he was admitted into St. George's Hospital. At this time the knee was extremely painful and tender, and much swollen ; the swelling not having the form of the articulating ends of the bones, but being most prominent on the anterior and lower part of the thigh, underneath the lower portion

of the extensor muscles. The fluctuation of fluid might be distinctly felt, within the synovial membrane.

Eight ounces of blood were taken from the knee by cupping. The loss of blood was immediately followed by an abatement of the pain, tenderness, and swelling. On the 30th of August a blister was applied.

The cupping was repeated on the 9th and 18th of September, and on the 4th of October, and each time was followed by the application of a blister.

On the 10th of October the joint was free from all pain and tenderness. It was stiff, and still slightly swollen, but no fluid was perceptible, the swelling appearing to arise entirely from solid substance. He was directed to use a stimulating liniment twice in the day.

On the 18th of October there had been no return of inflammation, and the stiffness and swelling were diminished. Friction was now employed, by means of the

hand, with starch powder every morning and evening; and in a few days afterwards, it was directed, in addition to the friction, that hot water should be pumped on the joint, so as to fall on it from a height of several feet, for half an hour every morning.

About the middle of November he was dismissed from the hospital; the joint being now nearly as small, and as moveable as before the inflammation had taken place.

CASE IV.

Robert Stewart, eighteen years of age, was admitted into St. George's Hospital on the 26th of January 1814.

He said, that about seven weeks before his admission, the right knee had become swollen and painful without any evident cause. The pain and swelling took place about the same time. The pain was severe, and attended with some degree

of fever. About a fortnight before his admission, the joint was cupped, and the swelling and pain became much diminished, and the leg more moveable. The cupping had been repeated on the day previous to his coming to the hospital, and again afforded him relief.

At the time of his being admitted into the hospital, the knee was still much swollen, the swelling extending up the anterior and lower part of the thigh under the extensor muscles: and it appeared to arise chiefly from solid substance effused within the articulation, very little fluid being to be distinguished. There was but little pain or tenderness; the joint admitted of a limited motion: he said, it was less stiff, than it had been a short time before.

On the 27th of January eight ounces of blood were taken from the knee by cupping, and afterwards a blister was applied.

On the 5th of February the blister was healed. The swelling was much di-

minated. The solid substance, which had been effused, was in great measure absorbed, so that the form of the articulating ends of the bones could be distinguished. The blister was repeated.

On the 18th of February, the joint was scarcely larger than natural, but it was still stiff in a slight degree. The stiffness disappeared under the employment of friction with mercurial ointment and camphor, and on the 23d of February he was dismissed from the hospital as cured.

CASE V.

John Hannam, a stout middle-aged man, was admitted into St. George's Hospital under Mr. Keate, on the 22d of May, 1811.

He said that six years ago he had wrenched his right knee, which in a few hours became swollen and painful. In the course of a month the pain and the

swelling subsided, and he returned to his duty as a soldier, in one of the regiments of Life Guards: but from that period he experienced, what he termed, a weakness of the joint, and he had a return of pain and swelling, whenever he made any unusual exertion. A year and a half previous to his coming to the hospital, he was ill of a fever. From this time the knee was more swollen and painful; and he continued in this state, sometimes better, sometimes worse, so that he was unable to do his duty, and he was in consequence discharged from his regiment.

At the time of his admission the knee was swollen; partly from fluid in its cavity, partly from thickening of the soft parts. The swelling extended some way up the anterior part of the thigh, and was prominent on each side of the ligament of the patella. The joint was stiff, but admitted of an imperfect flexion and extension. He complained of some degree of pain when at rest, but the pain

was more severe, whenever he attempted to exercise the limb. There was an enlarged lymphatic gland in the groin.

The knee was cupped several times, while the patient remained in the hospital. Blisters and stimulating liniments were employed, and about the end of September he left the hospital, better than when he was admitted; but there was still pain, whenever he made any unusual exertion, and the joint was swollen and stiff, though in a less degree than formerly. The swelling now appeared to arise altogether from solid substance, no fluid being perceptible.

Fifteen months afterwards I had an opportunity of seeing him again. There was very little alteration in the state of the knee. He said that whenever he took more exercise than usual, or was exposed to cold, inflammation took place, and the swelling was increased; but that by remaining for a short time in a state of quietude these symptoms were always relieved.

The three preceding cases are sufficient to illustrate the ordinary characters, and the ordinary progress of this disease. Those which follow are intended to explain certain circumstances, which, although of less frequent occurrence, are occasionally met with, and which it is of much consequence for the surgeon to understand.

CASE VI.

A young gentleman, about thirteen years of age, in July 1817, was seized with inflammation of the synovial membrane of one knee, attended with the usual symptoms. Blood was taken from the knee by means of leeches and cupping; and cold lotions were applied; and the violence of the inflammation subsided. In the beginning of October a blister was applied; and at the end of October, the knee was in the following state. It was larger

than the other ; the swelling having the form of the articulating extremities of the bones, and appearing to arise from a thickened state of the synovial membrane. The joint admitted only of a limited degree of motion, and the motion of it beyond a certain point was productive of pain. He was now directed to employ friction with a stimulating liniment.

The complaint continued very nearly in the same condition until the middle of November, when the swelling became suddenly reduced, and almost wholly disappeared. But on the same day he complained of an acute pain in his head, shooting from the temples to the forehead just above the eyebrow. This pain went off in a few hours, leaving only a slight soreness ; and for several days it returned periodically, in the form of a nocturnal paroxysm, of great severity, but of only a few minutes' duration. Leeches and blisters were applied both to the head and

legs ; and purgatives were administered. At the end of a week the pain ceased ; but he was seized with great somnolency, which was soon followed by strabismus, partial blindness, and almost total cessation of speech ; and after remaining in this state about a week he died.

The body was not examined.

CASE VII.

James Burton, forty years of age, was admitted into St. George's Hospital on the 2d of June, 1813, labouring under a complaint of his left knee. He said, that two years ago the joint became painful and swollen, at first in a slight degree, but afterwards the pain and swelling increased ; and he observed that the symptoms were always aggravated on the coming on of cold or wet weather. For the last nine months he had been unable to use the joint, sufficiently to enable him to attend to his usual occupa-

tions. Blisters and issues had been employed at various times, and as he thought with some temporary relief. At the time of his admission the knee was swollen in consequence of fluid being collected within the cavity of the synovial membrane. The fluid might be distinctly felt to fluctuate underneath the patella when the two hands were placed, one on each side of the joint. The soft parts were somewhat, but not considerably thickened. He had very little pain except on motion; was unable to bend the leg beyond the right angle, but could extend it completely. The swelling of the joint appeared greater than it really was, on account of the wasting of the muscles of the thigh and leg.

Blood was taken from the knee by means of cupping; and afterwards several blisters were applied in succession. He took five grains of the *pilula hydrargyri submuriatis* every night. On the 2d of August a blister was applied, and kept

open by dressing it with the savine cerate. At the end of three weeks he complained of pain, and a sense of irritation, extending up the thigh and down the leg. These symptoms were attributed to the open blister, and were immediately relieved when the blistered surface was allowed to skin over. On the 20th of September he quitted the hospital, being free from all his former symptoms, except that there was still a slight degree of stiffness of the joint.

In the beginning of July, 1815, the same patient came again under my observation. At this time, both knees were distended with fluid; the right shoulder was swollen, but in a less degree: and there was a collection of fluid in the synovial membrane, which forms the sheath of the tendons, on the posterior part of each wrist. On examining the right knee, which was the most swollen of the two, a sensation was communicated to the hand, as if produced by a number of small

loose substances, of a soft consistence, within the cavity of the joint ; and just perceptible to the touch. The joints were moveable, and very little painful. He said that all these swellings had begun about three months after he formerly quitted the hospital, with a slight degree of pain, and had gradually increased.

I suspect the loose substances, which were felt within the knee in this case, to have been portions of coagulable lymph, which had been effused on the inner surface of the synovial membrane, and afterwards had become detached ; similar to those, which are sometimes formed in the cavity of an inflamed bursa mucosa, and which I shall have occasion to describe hereafter. I had not the opportunity of observing the subsequent progress of the disease in this patient ; and I have never been able to ascertain the correctness or incorrectness of this opinion, respecting these loose substances, by dissection. They are certainly of a

different nature from the loose cartilages, which are met with in other cases.

CASE VIII.

Amy Brookes, fifty-four years of age, was admitted into St. George's Hospital on the 10th of June, 1818.

Three years ago, her right knee became swollen and painful, and the pain and swelling had existed ever since, sometimes in a greater, sometimes in a less degree. At the time of her admission, the knee was much swollen, in consequence of fluid collected in its cavity. There was pain in the joint, which was aggravated by motion; but which was not sufficient to interfere with her rest at night, or to prevent her going about her usual occupations. On examining the knee, a sensation was given to the hand, as if some soft loose substance was formed within the joint; and a crepitus was distinguished, on moving the patella from one side to the other.

During the time of her stay in the hospital, blood was taken from the knee twice by cupping, and once by leeches; and two blisters were applied. July 15th, she was discharged as cured; there was no pain nor swelling; the loose substance was no longer perceptible, and the crepitus could scarcely be distinguished.

The crepitus which was observed in this case, occurs only in a few instances, and I know not from what cause it proceeds. It is different from that which I have met with where there has been reason to believe that the cartilages are destroyed so as to expose the bone underneath.

The following case furnishes an example of a disease, which, as far as I know, has not been described by any pathological or surgical writer. One of the most remarkable symptoms, which the disease produces, is an inflammation of the synovial membranes; for which

reason it is to be regarded as connected with the present subject, and may be properly introduced in this place.

CASE IX.

A gentleman, forty-five years of age, in the middle of June, 1817, became affected with symptoms resembling those of gonorrhœa. There was a purulent discharge from the urethra, with ardor urinæ and chordee. On the 23d of June he first experienced some degree of pain in his feet. On the 24th the pain in the feet was rather increased, but not in a sufficient degree to prevent his walking four miles. There was some appearance of inflammation of his eyes.

June 25th, the pain in his feet was more severe; the tuniçæ conjunctivæ of his eyes were much inflamed, with a profuse discharge of pus.

These symptoms increased in violence, the pulse varying from 80 to 90 in a

minute; the tongue being furred; and the patient being restless and uncomfortable during the night. The whole of each foot became swollen; there was inflammation of the synovial membranes of the ankles; and it appeared to me, that the affection of the feet themselves arose from inflammation of the synovial membranes belonging to the joints of the tarsus, metatarsus, and toes. He said that he could compare the pain, which he experienced, to nothing else than that which might be supposed to arise from the feet being squeezed in a vice.

On the 27th of June the left knee became painful, and on the following day the synovial membrane of this joint was found exceedingly distended with synovia. He was now completely crippled; compelled to keep his bed, and scarcely able to vary his position in the smallest degree without assistance. The inflammation of the eyes and urethra was somewhat abated.

June 30th, the inflammation of the eyes and urethra had much subsided, and the purulent discharge was diminished. The pains of his joints were less severe; and the feet were less swollen. On the following day the knee was less swollen also.

He continued to mend, and on the 10th of July the swelling of the feet was still further diminished, and that of the knee had almost wholly disappeared. His pulse continued to vary from 80 to 90 in a minute, and his tongue was still furred. He had pain in the feet and knee, but less severe than formerly, and he was restless at night.

July 13th, he complained of pain in the right knee, and on the following day there was pain also of the right elbow and shoulder.

The right knee afterwards became swollen from fluid within the cavity of the synovial membrane, but not in the same degree with the other knee, and

the swelling soon subsided. There was never any perceptible swelling of the shoulder and elbow.

August 1st, all his pains were abated. The eye and the urethra were nearly free from inflammation, and the purulent discharge was scarcely perceptible.

August 5th, he was free from pain except on motion; the joints, which had been affected, were stiff; but he was able to move about on crutches.

From this time he progressively mended. The stiffness of the joints diminished very slowly; but he was free from all uneasiness. He was longer in recovering the use of the shoulder, than that of the other joints.

In the following December, 1817, (at which time he had nearly, but not completely recovered the use of his limbs,) he had another attack of the complaint. The symptoms were the same as formerly, taking place in the same order, and pursuing the same course, but with

a much less degree of violence. This second attack lasted about six weeks ; and left him again considerably crippled.

In March, 1818, he became affected with an ophthalmia, but of a different nature, from that which he laboured under in the preceding summer. The inflammation was seated in the proper tunicks of the eye ; and it appeared probable, that it would speedily have terminated in adhesions of the iris, and destruction of the powers of vision, if its progress had not been arrested, by repeated blood-lettings, and the use of mercury.

In order that the history of the disease might be rendered as simple as possible, I have described the symptoms in this case without hitherto adverting to the treatment, which was employed.—Leeches, and blisters to the knee ; liniments rubbed on the knees and shoulders ; and fomentations when there was severe pain ; formed the principal to-

pical remedies. Of the various medicines, which were exhibited, none seemed to be productive of benefit with the exception of the *vinum colchici*. It was under the use of this medicine, that not only the pains and swellings of the joints; but that even the purulent inflammation of the eyes and urethra first began to subside: and I am on the whole inclined to believe that my patient was indebted to it for a much more speedy recovery than he would have had otherwise.

I have had the opportunity of seeing four other cases, in which a similar train of symptoms took place.

One gentleman has had as many as eight attacks of this complaint. The first took place when he was under twenty years of age, and the others at various intervals in the course of the next seventeen years. In one of them the first symptom was inflammation of the ure-

thra, attended with a discharge of pus, although from particular circumstances he could not believe that he had been exposed to the risk of infection. This was followed by purulent ophthalmia, and that by inflammation of the synovial membranes. In three of the attacks a purulent ophthalmia was the first symptom; which was followed by inflammation and discharge from the urethra; and then the synovial membranes became affected: and in the other four attacks the affection of the synovial membranes took place without any preceding inflammation either of the eye or urethra. The disease was not confined to the synovial membranes of the joints, but those of the bursæ mucosæ were inflamed also. In some of the attacks the muscles of the abdomen were painful and tender, and subject to spasmodic contractions; and there was an occasional impediment to breathing, which seemed to arise from a similar affection of the diaphragm. The acute form of the disease, in this case,

lasted from six weeks to three months, but nearly a year generally elapsed before the use of the limbs was perfectly restored. The last attack began in July, 1817; and in the beginning of May, 1818, while he was still lame, he was seized with a very violent inflammation of the sclerotic coat and iris of one eye, which was subdued by very copious blood-letting, and the exhibition of mercury.

Another gentleman gave the following history of his complaints: In the year 1809, he had symptoms resembling those of gonorrhœa, and, when these had continued for some time, one testicle became inflamed and swollen. This was followed by a purulent ophthalmia, and inflammation of the synovial membranes. In the year 1814, he had a similar attack, with the exception of the swelled testicle; and in the year 1816, when I was consulted, he still laboured under a chronic inflammation of the synovial membranes of the knees and ankles, the

consequence of the last attack, and by which his lower limbs were completely crippled.

In the fourth case the patient laboured under a severe ophthalmia, which was followed by inflammation of the urethra, and then the joints became affected : but I had no opportunity of watching the progress of this case, nor have I heard any other particulars of it.

In the fifth case the patient laboured under strictures of the urethra. He had had four attacks of the disease which has been just described in the course of a few years. The inflammation of the urethra was in all of them the first symptom ; which was followed by purulent ophthalmia, and afterwards by inflammation of the synovial membranes, and swelling of nearly all the joints. In two of these attacks, he attributed the discharge from the urethra to his having received the infection of gonorrhœa, and in the two others to the use of the bougie.

CHAP. II.

ON ULCERATION OF THE SYNOVIAL MEMBRANE.

WHEN an abscess has formed in a joint, an ulcerated opening takes place in the synovial membrane, through which the matter is discharged. The following are the only cases, which have come under my observation, where ulceration of the synovial membrane has occurred as a primary affection. The most remarkable circumstance which they demonstrate is, that a disease, apparently slight, and of a part, which is in no way concerned in the vital functions, should produce such a degree of disturbance of the constitution as to occasion death. Of this, however, they form by no means a solitary example; and every surgeon and physiologist will be able to call to mind numerous other instances, which show that an impression made upon a small part of the nervous

system may derange, and ultimately destroy, the functions of the whole animal machine.

CASE X.

A young lady, nine years of age, being at play, on the 1st of January, 1808, fell and wrenched her hip. She experienced so little uneasiness, that she walked out on that day as usual. In the evening she went to a dance; but while there was seized with a rigor; was carried home, and put to bed. Next morning she was much indisposed, and complained of pain in the thigh and knee: on the following day she had pain in the hip, and was very feverish. These symptoms continued; she became delirious; and she died just a week from the time of the accident.

On inspecting the body on the following day, the viscera of the thorax and

abdomen were found in a perfectly healthy state. The hip-joint on the side of the injury contained about half an ounce of dark-coloured pus: and the synovial membrane, where it was reflected over the neck of the former, was destroyed by ulceration, for about the extent of a shilling.

CASE XI.

A middle-aged man, who had met with a contusion of one shoulder, was admitted into St. George's Hospital in the winter of 1812. He complained of pain and tenderness of the shoulder, and a very slight degree of swelling was observable: but his principal disease was a fever, resembling typhus in its character, of which he died in a few days after his admission.

On inspecting the body, about half an ounce of thin pus was found in the shoulder-joint. The synovial membrane

bore marks of general inflammation, and in one spot, where it was reflected over the neck of the os brachii, it was destroyed by ulceration for about the extent of a sixpence.

CHAP. III.

ON CASES, IN WHICH THE SYNOVIAL MEMBRANE
HAS UNDERGONE A MORBID CHANGE OF
STRUCTURE.

SECT. I.

Pathological Observations.

THERE are some diseases, which consist simply in a morbid action; there are others, in which the morbid action produces a morbid change of anatomical structure.

Diseases of the latter class differ in their nature in different organs. Thus the tubercles, which affect the lungs in phthisis pulmonalis, are never met with in the breast; and cancer, which is frequent in the breast, never attacks the

lungs, except by extending to them from the contiguous parts.

The disease, which I am about to describe in the present chapter, consists in a morbid alteration of structure, which takes place in the synovial membranes of joints, and which, as far as I have seen, is peculiar to these parts. I have never known an instance of the same disease in the serous membranes, which so nearly resemble the former in their nature and functions; nor, even, in the synovial membranes, that constitute the bursæ mucosæ and sheaths of the tendons.

Several years since, in examining a diseased elbow, I found the cartilaginous surfaces completely destroyed by ulceration: an abscess had formed in the joint, and no remains were observable of the natural structure of the soft parts, these being every where converted into a pulpy substance, of a light brown colour, and about one-third of an inch in thickness. As the ravages of the disease were very

extensive, it was impossible to determine from the appearances on dissection, where the morbid action had originated. This case, however, differed materially from some others which I had met with, in which the destruction of the cartilages was not attended by any affection of the soft parts similar to that, which has been described. The following cases, which have since occurred, furnish examples of the same disease in earlier stages of its progress, and shew that it begins in the synovial membrane, and that the other parts become affected only in a secondary manner.

CASE XII.

In a diseased knee, which was sent to me for examination by my friend the late Mr. Horn, surgeon to the Newcastle Infirmary, I found, in the cavity of the joint, about four ounces of a pale yellow fluid, having flakes of coagulable lymph

floating in it. The synovial membrane, where it formed the loose folds, extending from one bone to the other; where it was reflected over the bones themselves, the crucial ligaments, and the fatty substance of the joint; had completely lost its natural appearance. It was converted into a pulpy substance, in most parts about a quarter, but in some parts, nearly half an inch in thickness, of a light brown colour, intersected by white membranous lines, and with red spots formed by small vessels injected with their own blood. The synovial membrane on the edge of the cartilaginous surfaces had undergone a similar change of structure, but only for a small extent. The semilunar cartilages were entire, but in a great measure concealed by the pulpy substance projecting over them. The cartilages covering the bones, in a few places were in a state of incipient ulceration.

CASE XIII.

Martha Manners, twenty-six years of age, was admitted into St. George's Hospital on the 6th of March, 1813, on account of a disease in her right knee.

She said that in June, 1811, she first observed the joint to be swollen and stiff; and from this time, the swelling and stiffness increased; but in the first instance by very slow degrees. About Michaelmas, 1812, she caught cold, and the swelling increased more rapidly, but it was not attended with any considerable quantity of pain.

At the time of her admission into the hospital, the right knee measured about two inches in circumference more than the left. The swelling was elastic; prominent at the upper and lower part of the joint; not having the form of the articulating ends of the bones. The joint admitted of motion, but the leg could not

be completely bent or extended on the thigh.

Various remedies were employed without the smallest benefit. The stiffness of the joint increased. About the middle of May, she began to experience considerable pain, and soon afterwards an abscess presented itself by the side of the ligament of the patella, which was opened on the 15th of June. The orifice made by the lancet healed in a few days; but she continued to suffer severe pain; her health became much affected, and on the 6th of August the limb was removed by amputation.

On examining the joint, about an ounce of thick matter was found in its cavity. The ligaments were in a natural state. The synovial membrane had undergone precisely the same alteration, as in the case which has just been related. The only point of difference that could be observed, was, that the whole of that portion of the membrane, which is re-

flected over the cartilages, had become affected, presenting the same appearance as elsewhere, but being thickened in a less degree. The cartilages had begun to ulcerate in a few spots; but the ulceration had made so little progress, that it might not have been noticed on a superficial inspection.

CASE XIV.

Samuel Langford, 24 years of age, was admitted into St. George's Hospital on the 22d of April, 1812.

At the time of his admission, one of his knees was swollen to nearly twice its natural size. The swelling was prominent on the anterior and lower part of the thigh. It was soft and elastic, so that at first it appeared to contain fluid, but on particular examination, the absence of fluid was ascertained, by the want of fluctuation. The leg was kept in the half-bent state, and the joint ad-

mitted of only a very limited degree of motion. He had no pain, even when attempts were made to move the limb. The skin, over the diseased part, was of a pale colour, with some dilated veins ramifying in it. On each side of the joint, a small orifice was observed, through which the probe might be introduced into a sinus; but the sinuses appeared to be of small extent. His general health was unimpaired. He said, that two years ago, he first experienced some pain in the knee, but it was not sufficient to prevent his going about his usual occupations. Soon afterwards the joint began to swell, and the enlargement gradually increased from that period. Several abscesses had formed at different times, but the greater number of them had healed.

About two months after his admission into the hospital, the limb was amputated.

On dissecting the diseased joint, the ligaments were found in a perfectly natural

state. The whole synovial membrane, except where it was reflected over the cartilages, was converted into a pulpy, elastic substance, of a brown colour, intersected by white membranous lines, in some places half an inch in thickness, in others more; and in those parts, where the membrane was reflected over the bones, near the border of the cartilages, it was destroyed in spots by ulceration.

The semilunar cartilages were in a natural state, but in a great measure concealed, in consequence of their being enveloped in the mass of substance formed by the diseased synovial membrane. The cartilaginous surfaces of the femur and patella were extensively, but not entirely destroyed by ulceration; the ulceration being greatest towards the circumference. On the internal portion of the head of the tibia, the cartilage was destroyed only for a very small extent, the ulceration being entirely confined to the margin. On the external portion of the head of

the tibia, the cartilage was absorbed to a greater extent. The bones possessed their natural structure and hardness. The cavity of the joint contained matter, and the sinuses communicated with it.

CASE XV.

Michael Purcel, sixteen years of age, was admitted into St. George's Hospital, on the 10th of July, 1811, on account of a disease in the right knee.

He said that in the summer of 1807, he had received a blow on the inside of the joint. Some time afterwards a swelling formed and burst, and some fluid was discharged. In about a week the orifice healed ; a slight degree of stiffness only remained, and he was able to follow his usual occupations. He continued well till December, 1810, when the joint was observed to be increased in size. From this time the swelling increased, but with no other inconvenience than

stiffness of the joint, and a slight degree of pain in walking.

At the time of his admission into the hospital, there was a large swelling of the knee, extending an inch or more up the anterior part of the thigh, under the extensor muscles. The swelling was more prominent in some parts, than in others. It was soft and elastic, and gave to the hand an indistinct sensation, as if it contained fluid. The leg was kept in a half-bent position, and was nearly immoveable on the thigh. He had no pain, except on motion or pressure.

On the 28th of November, an abscess burst on the outside of the joint, and discharged a small quantity of pus. After this other abscesses formed, and burst at various times. The swelling continued to increase. Amputation was performed on the 6th of April.

On dissecting the amputated joint, all the ligaments were found in a natural state. The synovial membrane had pre-

cisely the same appearance as in the last case. In some parts it was half an inch, in others more than an inch in thickness. The cartilages were for the most part destroyed by ulceration, and * carious surfaces of bone were exposed. The abscesses appeared to have formed in the substance of the synovial membrane, and did not communicate with the cavity of the joint, nor did the joint contain pus.

CASE XVI.

A boy, six years of age, was admitted into St. George's Hospital, in March, 1808, on account of a disease in one knee.

* In using the term *caries*, on this and on other occasions, I have considered it as synonymous with ulceration; or, at least, as expressing that state in bones, which corresponds to ulceration in soft parts. Some confusion has been produced in pathological nomenclature in consequence of this term having been employed by some, to express, not only bone, which is ulcerated, but that whose surface has been exposed from other causes.

The joint was larger than the natural size. The leg was bent at a right angle to the thigh, and admitted of no motion. The skin on the outside was ulcerated to a considerable extent. Various remedies having been employed without success, the limb was amputated on the 29th of April. On examining the joint, the synovial membrane was found to have undergone a morbid change of structure similar to that in the preceding cases, but with this difference, that the pulpy substance into which it was converted, projected into the joint, so as nearly to fill its cavity, and adhered to the cartilaginous surfaces. On making a longitudinal section of the joint, the cartilage covering the bones was seen, as a white line, about one-tenth of an inch in thickness, connected to the bone on one side, and having the pulpy substance adhering to it on the other. It was, therefore, thinner than natural; but otherwise entire, except at the posterior part of one

of the condyles of the femur, where it was destroyed by ulceration for a small extent. There were no distinct remains of the ligaments external to the joint, and only some small vestiges of the crucial ligaments and semilunar cartilages.

CASE XVII.

John Dillemore, thirteen years of age, was admitted into St. George's Hospital, in the summer of 1812, on account of a disease in one knee. At that time the joint was slightly swollen and stiff, so as to admit of only a very limited degree of motion. He was free from pain. The swelling was elastic, without any perceptible fluctuation of fluid. These symptoms had been coming on gradually about two years previous to his admission. At this time he remained in the hospital for upwards of three months; and a great number of remedies, which it is unnecessary

to enumerate, were employed without the smallest benefit.

On the 26th of January, 1814, he was re-admitted into the hospital. The affected knee was about two inches and a half in circumference more than the other. The swelling was elastic; it extended up the anterior and lower part of the thigh, as in cases of inflamed synovial membrane, but its form was less regular, being more prominent, and extending higher up on the outside than on the inside. The leg was kept in the half-bent position, and was perfectly immoveable on the thigh. He was subject to occasional attacks of violent pain. He said, that the swelling had gradually increased from the period of his quitting the hospital in 1812, but that he had not been subject to very severe pain, till about six weeks previous to his re-admission. On the 31st of January the limb was amputated.

On examining the diseased joint, the synovial membrane was found converted into a pulpy substance of a light brown colour, with red spots arising from vessels ramifying in it, injected with their own blood, and intersected by very numerous membranous lines. On the outside of the joint, the diseased membrane was in some places nearly an inch in thickness. The membrane covering the cartilages in some parts was in a natural state; in other parts, it had undergone the same morbid change of structure as elsewhere. The cartilages were ulcerated in spots. There was about half an ounce of pus in the cavity of the joint; and there were two or three abscesses in the substance of the synovial membrane, not communicating with the joint, containing about the same quantity of purulent matter.

CASE XVIII.

William Hine, twenty-three years of age, was admitted into St. George's Hospital on the 12th of December, 1814, on account of a complaint in one of his knees. He said, that in the summer of 1812, he first observed a slight degree of stiffness and swelling of the joint, unattended by pain. At first the swelling was confined to the inside, but it gradually extended itself over the whole circumference of the joint. The stiffness and swelling slowly, but uniformly, increased: about the end of the year 1813, he first began to experience considerable pain.

At the time of his admission, the knee was much swollen; the swelling was irregular, and most prominent on the inside; it was soft and elastic, without the fluctuation of fluid. He complained of constant, deep-seated, gnawing pain, which disturbed his sleep. He had a

slight degree of hectic fever. On the 16th of December the limb was amputated.

On dissecting the amputated joint, the synovial membrane was found to have undergone the same morbid alteration of structure as in the last case. The cartilages were slightly ulcerated in a few spots.

CASE XIX.

James Gould, sixty-five years of age, was admitted into St. George's Hospital, in May, 1814. One knee was swollen and stiff, admitting of scarcely any motion. The swelling was elastic. He complained of severe pain in the joint. Near the ligament of the patella was the orifice of a sinus, communicating with the articular cavity, and discharging a very small quantity of pus. No clear history could be procured of the disease in its earlier stages, but it appeared, that he had been subject

to repeated attacks of inflammation of the synovial membrane.

The limb was amputated on the 23d of May.

On dissection, the ligaments, bones, cartilages, and that portion of the synovial membrane which is reflected over the cartilages, were found to be in a natural state; but the synovial membrane in other parts had undergone the same morbid alteration of structure as in the preceding cases.

These cases furnish examples of the same disease in different stages of its progress. The morbid action evidently originates in the synovial membrane, which loses its natural organization, and becomes converted into a thick pulpy substance, of a light brown, and sometimes, of a reddish-brown colour, intersected by white membranous lines. As the disease advances it involves all the parts, of which

the joint is composed, producing ulceration of the cartilages, caries of the bones, wasting of the ligaments, and abscesses in different places.

I have already remarked, that this disease is peculiar to the synovial membranes; at least that I have never met with it, in any other part of the body: but it belongs to the same order with tubercles of the lungs, scirrhus of the breast, the medullary sarcoma or fungus hæmatodes of the testicle, and numerous others, in which the natural structure of the affected organ is destroyed, and a new and different structure is added in its place. To these also it bears a near resemblance in its progress. Thus, tubercles of the lungs in the first instance, occupy the vesicular and interlobular substance; but ultimately, they inflame and ulcerate; abscesses form in them, and then the pleura, the bronchia, and other contiguous parts become affected. Similar circumstances mark the progress

of other maladies of the same description.

The cases, which have been related are not the only ones, in which I have had the opportunity of tracing the same morbid appearances. I have also met with numerous others, in which the similarity of the history and symptoms, and the resemblance in the form and elasticity of the tumor, indicated the disease to be of the same nature, although I was not able to verify the fact by dissection. In every case, in which I have had it in my power to watch its progress, the complaint has been slow, and sometimes has remained in an indolent state, during a very long period: but ultimately it has always terminated in the destruction of the joint.

It is a remarkable circumstance, that this affection of the synovial membrane is rarely met with except in the knee. I have never known an instance of it in the hip or shoulder. It is probable that

the influence of the external cold may operate as one of the causes, by which the disease is produced, and this explains, why it occurs frequently in the knee, and seldom in the deep-seated articulations. *

It is evident from the history of cases, in which a part of the living body has assumed a new and morbid structure, that this alteration seldom takes place except by slow degrees; and it would add much to the interest and utility of researches in morbid anatomy if it were more frequently attempted to ascertain, what is

* The account of the *fungus articuli*, which has been given by some German writers, appears to have been drawn, partly, from cases of the disease described in this chapter, partly, from cases of inflammation of the synovial membrane. Mr. Russel seems to have taken his history of the pathology of white swelling, in great measure from cases similar to those, which have been related; but we must observe, that the term white-swelling has been applied, almost indiscriminately, to all the affections, to which the joints are liable, and by no means confined to that under our present consideration.

the first change in the organization of the affected part, which disease produces, and from thence to trace the gradual progress of the other changes, which take place, until the destruction of the natural organization is completed. Whether the following case is to be considered as of the same kind with those already recorded, but in an earlier stage of the disease, cannot at present be determined ; but it appears not improbable that it is so ; and I shall venture to relate it, in this place, in the expectation, that it may, at any rate, be of some service in assisting the investigations of future enquirers.

CASE XX.

— Belton, a boy eleven years of age, was admitted into St. George's Hospital in August, 1810, on account of a disease in one knee.

There was but little pain in the joint :

it was slightly enlarged, admitted of some motion, but not of complete flexion and extension. His parents said that the disease had begun about a year and a half before his admission into the hospital: that it had increased very slowly, and that he had never suffered from it any serious distress. Various remedies were employed without benefit; and in a short time his friends took him out of the hospital. A few weeks afterwards he died, in consequence of an accumulation of water in the ventricles of the brain.

I obtained permission to examine the body.

The synovial membrane of the affected knee externally had its natural appearance. Internally it was lined by a straw-coloured gelatinous substance, so intimately adhering to it, that it could not be detached, except by an artificial separation. The synovial membrane was encrusted in this manner, every where, except on the cartilaginous surfaces.

The gelatinous substance in general appeared about one-eighth of an inch in thickness, but in some parts, near the borders of the cartilages, it was much thicker, so as to project considerably into the cavity of the joint. In a few places, towards the margin of the articulating surfaces, the cartilage had begun to ulcerate; in some of these it was entirely absorbed; so that the bone was exposed; but, for the most part, there was only an irregular ulcerated surface towards the cavity of the joint: the remaining portion of the cartilage being entire, and having its natural adhesion to the bone.

The synovial membrane itself bore no marks of inflammation. In the substance with which it was lined, some vessels were observed ramifying, beautifully injected with their own blood, but these were few in number, and only in certain parts. This substance differed in appearance, from the coagulable lymph,

which is found on the surface of an inflamed membrane ; and we may presume, therefore, that the effusion of it was the result, not of inflammation, but of some other morbid action.

SECT. II.

On the Symptoms of this Disease.

THIS disease generally takes place in persons, who are not much above the age of puberty. I do not recollect more than one instance of it having occurred after the middle period of life. In general it can be traced to no evident cause, but occasionally it takes place in consequence of repeated attacks of inflammation. In this respect it resembles other diseases of the same order. Inflammation of the lungs may lay the foundation of tubercles, and inflammation of the breast may occasion the growth of a scirrhus tumor. Where I have had an opportunity of examining

the morbid appearances after amputation, I have always found the whole, or nearly the whole, of the synovial membrane affected by the disease; but it is probable, that if the examinations were made at an earlier period, we should often find the morbid change originating in some one point. At least this is in conformity to what we find in other maladies, which correspond to this in their nature: and in one instance, in a girl who laboured under this affection, and who died of a fever, I found one half of the synovial membrane altered in structure, and the other half retaining its natural appearance.

In the origin of this disease, there is a slight degree of stiffness and tumefaction, without pain, and producing only the most trifling inconvenience. These symptoms gradually increase. In the greater number of cases, the joint at last scarcely admits of the smallest motion, but in a few cases, it always retains a certain degree of mobility. The form of

the swelling bears some resemblance to that in cases of inflammation of the synovial membrane, but it is less regular. The swelling is soft and elastic, and gives to the hand a sensation as if it contained fluid. If only one hand be employed in making the examination, the deception may be complete, and the most experienced surgeon may be led to suppose that there is fluid in the joint, when there is none: but if both hands be employed, one on each side, the absence of fluid is distinguished by the want of fluctuation.

The patient experiences little or no pain, until abscesses begin to form, and the cartilages ulcerate; and even then the pain is in many instances not so severe, as where the ulceration of the cartilages occurs as a primary disease: and the abscesses heal more readily, and discharge a smaller quantity of pus, than in cases of this last description. At this period the patient becomes affected with

hectic fever; loses his flesh, and gradually sinks, unless the limb be removed by an operation.

The progress of this disease varies in different cases. In general, one or two years elapse before it reaches its most advanced stage; but sometimes the period is much longer; and occasionally it becomes indolent, so that it remains during many months without any sensible alteration. In like manner tubercles of the lungs, or scirrhus of the breast, in some instances remain in an inactive state for several months, or even for one or two years.

The diagnosis of this disease is seldom difficult. The gradual progress of the enlargement, and stiffness of the joint without pain, and the soft elastic swelling without fluctuation, in the majority of cases enable us to distinguish it readily from all the other morbid affections to which the joints are liable.

The cases, with which those of this

disease are most liable to be confounded, are those of chronic inflammation of the synovial membrane.

1st, When the synovial membrane has undergone a morbid change of structure, it occasionally happens that a preternatural secretion of fluid takes place at the same time from its inner surface ; and the joint becomes distended, not with synovia, but with a turbid serum having flakes of coagulable lymph floating in it, which causes the tumor to present nearly the same external characters, as where the synovial membrane is inflamed. But here the swelling will not yield to that treatment, under which it would be speedily reduced if it depended on simple inflammation ; and attention to this circumstance, joined with an accurate previous history, will enable us to recognise the real nature of the disease.

2dly, When the synovial membrane after inflammation has subsided has been left in a thickened state, and coagulable

lymph has been effused into the articular cavity, the tumor in some instances a good deal resembles the tumor, which occurs in cases of this disease : so much so, that it will be very difficult to give a correct opinion, merely from observing the present appearance and condition of the joint. The surgeon must in great measure form his judgment from the account, which he receives of the origin and early symptoms of the complaint ; or (when an accurate statement cannot be procured) by waiting to observe its future progress.

SECT. III.

On the Treatment.

WHEN a part is swollen and rigid in consequence of inflammation, the swelling and rigidity may often be dispersed ; but I know of no instance, in which an organ having completely lost its natural structure, is capable of having that structure restored. Physicians and surgeons

have been employed during successive ages, in endeavouring to discover a cure for tubercles of the lungs, and cancer of the breast, and the result of their labour is only to prove that these diseases are incurable. Analogy therefore would not lead us to be sanguine as to the discovery of a remedy for this affection of the synovial membrane, and experience shews that it is equally incurable with other maladies of the same order. It would be needless for me to occupy the time of my readers, by a detail of the various remedies, which I have tried, or seen tried by others, in cases of this description : since the general result of these trials was only to lead to the above conclusion. By means of rest and cold lotions, the progress of the disease may be somewhat checked, as the suppuration of tuberculated lungs may be retarded by occasional bleeding, and a milder climate. Where there is considerable pain in consequence of the cartilages having begun to ulcerate, some benefit is

derived from the use of warm fomentations and poultices. But no method, with which I am acquainted, is capable of doing more than somewhat checking the progress, and somewhat relieving the symptoms of the complaint. In every case, of which I have had an opportunity of seeing the termination, the ulceration of the cartilages, the formation of abscesses in the cavity of the joint, and the consequent disturbance of the patient's general health, have ultimately rendered the amputation of the limb necessary, in order to preserve the patient's life. At this period therefore the surgeon is called upon to recommend and urge an operation; but at an earlier period, it is a matter of choice with the patient, whether he will live with the incumbrance of an useless limb, till the advanced stage of the disease renders its removal indispensable, or whether he will submit to the loss of it, before the absolute necessity for losing it exists.

CHAP. IV.

ON THE ULCERATION OF THE CARTILAGES OF JOINTS.

SECT. I.

Pathological Observations.

THE cartilages of joints differ in some essential circumstances from those, which are employed in other organs. The latter are more vascular, more liable to become inflamed; and inflammation in them usually terminates in the deposition of osseous matter. The articular cartilages in the adult possess no vessels capable of carrying red blood. Inflammation is not in them a frequent occurrence; when it does take place, it terminates in ulceration, and not in the formation of bone. Ulceration of cartilage may be the consequence of inflammation of the

cartilage itself, or of the bony surface, to which it is connected; but in many instances there are no evident marks of inflammatory action having preceded it, either in one part or the other, and the inflammation, which afterwards takes place appears to be rather the attendant on, than the cause of, the ulcerative process. The ulceration of soft parts is usually, and, as far as I know, always attended with the secretion of pus; but it is otherwise with the articular cartilages, in which suppuration seldom takes place, while the ulcer is small, and often the disease proceeds so far, as to cause caries of the bones to a considerable extent, without matter being formed in the joint. This circumstance is deserving of notice. It has been long established that suppuration may take place without ulceration; and it appears, that, in this instance, ulceration may take place without the formation of pus.

In the cases, which have been related,

the ulceration of the cartilages of the diseased joints was a secondary affection, the consequence of a morbid action originating in the neighbouring soft parts. There are other cases, and those not of rare occurrence, in which the ulceration of the articular cartilages exists as a primary disease.

When the ulceration of the cartilage occurs in the superficial joints, it constitutes one of the diseases, which have been known by the name of white-swelling. From cases, which I have met with, I am led to conclude, that when it takes place in the hip, it is this disease, which has been variously designated by writers, the “*Morbus Coxarius*,” the “*Disease of the Hip*,” the “*Scrophulous Hip*,” the “*Scrophulous Caries of the Hip-joint*.” At least it is to this disease, that these names have been principally applied, though probably, other morbid affections have been occasionally confounded with it.

CASE XXI.

In examining a body, brought into the dissecting-room in Windmill-street, I found the cartilage in a diseased state, in the joints of both hips, of one of the knees, and of both elbows. In some spots, the cartilages of these joints were altogether destroyed by ulceration, and carious surfaces of bone were exposed; in others, the cartilage was not completely absorbed, but it had the appearance of fibres, which were connected at one extremity to the bone, while the other extremity was loose towards the cavity of the joint, and having no lateral connection with each other. The intervertebral cartilages connecting the bodies of some of the dorsal vertebræ were also in a diseased state. They retained the usual appearance of concentric layers towards the circumference, but in the centre, instead of the white semi-fluid substance, which is met with under ordinary cir-

cumstances, they were found to be of a brown colour, of a solid and somewhat brittle texture, composed of several portions, having a very slight adhesion to each other. The ligaments, the synovial membranes, and the bones, were all in a natural state, except that the latter were occasionally carious in consequence of the absorption of the cartilage; but the caries was unattended by the formation of matter.

In this case, the original disease appears to have been a morbid state, and subsequent ulceration of the cartilages. It shews that where the disposition to it exists, the destruction of the cartilage may take place in several joints at the same time, and I have observed the same thing in many other instances.

The conversion of the cartilage into a soft fibrous structure, I am disposed to believe, is the frequent, though not the constant forerunner of ulceration. In a woman, who died a week after a severe

contusion of the hip, the cartilage of the head of the femur was found in some parts entirely absorbed, in others having a fibrous appearance, similar to what has been described, and I have noticed the same circumstance in other cases, sometimes connected with, and sometimes independent of local injury.

CASE XXII.

A boy, ten years of age, was admitted into St. George's Hospital, in April, 1809, on account of a disease of the left hip. The nates were wasted, and flattened; there was pain in the hip and knee, and a large abscess had formed which produced a tumor on the outside of the thigh. An issue was made with caustic behind the great trochanter. About a month after his admission, the skin over the abscess having become inflamed, I made an opening in it, with a lancet, and half a pint of pus was evacuated. The

orifice made by the lancet, healed by the first intention, but in a few days, pus was again collected in the abscess, and the tumor was larger and more tense than ever. The limb became shortened, the abscess burst externally, the boy became affected with hectic symptoms, and died on the 21st of October.

On examining the body, the abscess was found communicating with the cavity of the left hip. The capsular ligament and synovial membrane were not distinguishable from the other soft parts, forming the parietes of the abscess. There was no vestige of the round ligament, and no remains of cartilage on either of the bones composing the joint. The head of the femur was reduced by caries, to about one half of its natural size; and from the same cause, the acetabulum was rendered deeper and wider than is natural. At the posterior part, the margin of the acetabulum was more extensively absorbed, and the head of the femur had

been drawn out of its cavity, and was lodged on the dorsum of the ilium.

No other disease had been suspected to exist during life. If the boy had ever complained of pain in the right hip, the circumstance had been overlooked, on account of the greater disease in that of the opposite side. Having accidentally cut into the joint of the right hip, I found the cartilage covering the head of the femur, absorbed for about one-third of its extent, and the surface of bone, which was in consequence exposed, was covered by a thin layer of coagulable lymph. The cartilage lining the acetabulum, and all the soft parts belonging to the joint, were in a perfectly natural state, and the bones were of the ordinary texture and hardness.

CASE XXIII.

A girl, seven years of age, was admitted into St. George's Hospital, in May,

1809, on account of a complaint in the left hip. She had pain in the knee, the limb was shorter than is natural, and the nates were wasted and flattened. An issue was made with caustic, behind the great trochanter. Soon after her admission an abscess burst near the crista of the ilium. The disease in the hip appeared to be considerably relieved, but on the first of August, she died of an accidental attack of erysipelas.

On inspecting the body, the glutæi muscles of the left side were found wasted, and of a dark colour. A sinus extended from the external orifice of the abscess through the soft parts, and communicated with the hip-joint, by an ulcerated opening in the margin of the acetabulum.

There were no remains of cartilage on the surface of the acetabulum. The exposed bone was in a carious state, and of a dark colour, and the cavity of the acetabulum was rendered deeper and wider than is usual. The greater part of the cartilage was destroyed on the head

of the femur, and the small portion of it which remained, was readily separated from the bone. This circumstance is often met with, where cartilage is undergoing the process of ulceration.

The capsular ligament was somewhat thicker than under natural circumstances, and more connected with the surrounding parts. There were no remains of the round ligament.

In the anterior part of the joint, a quantity of organised soft substance, resembling that of adhesions, was interposed between the head of the femur and the acetabulum, and behind this was a collection of dark-coloured pus. From these two causes the head of the femur had been separated from the os innominatum, and pushed outwards, and it had afterwards been drawn upwards by the action of the muscles, so that it was lodged on the superior part of the bony margin of the acetabulum. The synovial membrane was of a dark colour, but not otherwise diseased.

On examining the hip of the opposite side, I found the soft parts external to it, the capsular ligament, synovial membrane, and fatty substance of the joint, having no appearance of disease. The cavity of the joint contained about a drachm of dark-coloured pus. The cartilage was absorbed from about one-third of the surface of the acetabulum. The exposed bone in most parts presented an uniform compact surface, but in two places it was in a state of superficial caries. In some parts of the head of the femur, the cartilage had a fibrous appearance, similar to what has been already described; in other parts it was entirely absorbed, and a carious surface of bone was exposed; and elsewhere it was in a natural state. The round ligament was ruptured by a very slight degree of force, which seemed to arise from the cartilage having been destroyed round its insertion into the acetabulum.

The bones in the neighbourhood of the carious surfaces of the left hip, were

of a darker colour than usual ; but no such appearance was observed in the bones of the other hip, which were in all respects in a healthy state.

CASE XXIV.

John Catnack, forty-four years of age, was admitted into St. George's Hospital on the 29th of September, 1813, with pains in the lower limb of the right side, extending from the hip to the knee, and resembling the pains of rheumatism. He attributed these pains to his having caught cold about a month before his admission. He laboured also under a complaint of his bowels, of which he died on the 4th of December. On dissection, no preternatural appearances were discovered, except in the right hip. The capsular ligament and synovial membrane were in a natural state. The cartilages covering the head of the femur, and lining the bottom of the acetabulum, were de-

stroyed by ulceration, for about one-half of their extent, and wherever the cartilage was destroyed, an ulcerated surface of bone was exposed. The round ligament was readily torn in consequence of ulceration having extended to it at the part, where it was inserted into the acetabulum. The bones possessed their natural texture and hardness. There was no pus in the joint. It was observed, that the ulcerated surface of the acetabulum corresponded to that of the femur, these surfaces being exactly in contact, in the position in which the patient had remained since his admission into the hospital.

CASE XXV.

William Bridges, twenty-one years of age, was admitted into St. George's Hospital, on the 28th of November, 1810. He gave the following account of his complaint. About the middle of the May

preceding, he first experienced a pain in the right knee, which was aggravated by walking. At the end of a month, the pain became so severe that he was under the necessity of being confined to his bed. He had slight pain in the hip; but that in the knee was intense, keeping him awake at night. An abscess formed, which in the September following burst on the inside of the thigh.

At the time of his admission, the nates were wasted and flattened; the limb on the affected side, appeared to be an inch and a half longer than the other; there was a large abscess in the posterior part of the thigh. He was emaciated, and laboured under a hectic fever. An issue was made with caustic, behind the great trochanter of the femur, and afterwards a second issue was made in the same manner on the anterior edge of the tensor vaginæ femoris muscle. Under this treatment, he experienced for a time great relief, notwithstanding several abscesses formed and burst in

different parts of the thigh. He became free from pain ; regained his flesh ; the hectic fever abated ; and the discharge from the abscesses was much lessened. The limb now appeared to be shorter than the other. He continued to mend, till the middle of February, 1811. At this period the former bad symptoms began to return. He was affected with a constant diarrhœa, and profuse perspirations, and he died on the 26th of March following.

On inspecting the body, the glutæi muscles were found wasted and shrunk, and in many parts their texture was destroyed by the abscesses, which communicated with the cavity of the joint by two ulcerated openings, one on the anterior and the other on the posterior part. The abscesses formed several sinuses in the neighbourhood of the joint, and the capsular ligament was in consequence connected to, and in some measure blended with the other soft parts.

The joint contained purulent matter. The synovial membrane was darker than natural, but otherwise had the ordinary appearance. There were no remains of the round ligament. The cartilages were every where absorbed, and the exposed surfaces of bone were in a carious state. The head of the femur was reduced to about two-thirds of its original size, and the acetabulum was rendered deeper and wider, nearly in the same proportion. At the bottom of the acetabulum, there was an ulcerated opening, just large enough to admit a common probe, communicating with an abscess within the pelvis. The carious surfaces of the bones, had the same dark colour and foetid smell, as in other cases of caries, but otherwise they did not differ from healthy bones.

CASE XXVI.

Jemima Holloway, about 23 years of age, was admitted into St. George's Hospital

on the 30th March, 1814, on account of a disease of the right hip. There was a large abscess in the neighbourhood of the hip, and the nates were wasted, and flattened. She said that the disease had been going on for some years. On the 6th of June following her admission, she died.

On dissection, the glutæi muscles were found wasted and flabby, and of a pale colour.

There was a large abscess of the nates communicating with the hip, by means of an opening in the posterior part of the capsular ligament and synovial membrane. In other respects the synovial membrane and capsular ligament were in a perfectly natural state.

The cartilages covering the head of the femur, and lining the bottom of the acetabulum were destroyed by ulceration. The ulceration had extended to the bones, so that, the head of the femur was not more than half, and the acetabulum was double the usual size. The bones

possessed their natural texture and hardness. There was an ulcerated opening at the bottom of the acetabulum, communicating with the inside of the pelvis.

I could add to the foregoing, an account of the dissection of several other cases, in which the hip was affected with the same disease ; but in doing so, I should only occupy the reader's attention unnecessarily. It will be sufficient to observe that :

1. In the most advanced stage of the disease, none of the parts entering into the composition of the joint retain their natural structure. The soft parts are blended into a confused mass. Sometimes the head of the femur is completely destroyed, and there remains only the neck, or a portion of the neck, of that bone. Often the projecting margin of the acetabulum is entirely absorbed, so that instead of a cavity, there is a broad

carious surface of the os innominatum. In a few instances a portion of the carious bone is found dead, and undergoing the process of exfoliation, or having already exfoliated into the cavity of the joint.

2. In whatever period of the disease, the examination is made, the cartilages are found in a state of ulceration, but the morbid affections of the soft parts and bones vary very much, nor are they much altered from their natural state, except in the most advanced stage of the malady.

From these circumstances, and from the appearances in several of the cases which have been related, in which the disease was found in its incipient stage, and wholly confined to the cartilaginous surfaces, we may be justified in concluding, that, in the ordinary cases of caries of the hip, the cartilage is the part primarily affected, and the following may be stated to be the progress of the disease.

1. Ulceration takes place in the cartilages : generally in that of the acetabulum first, and in that of the head of the femur afterwards ; sometimes it begins in both at the same time.

2. The ulceration extends to the bones, which become carious ; the head of the femur is diminished in size, and the acetabulum is rendered deeper and wider.

3. Abscess forms in the joint, which after some time makes its way, by ulceration, through the synovial membrane and capsular ligament, into the thigh, or nates, or even through the bottom of the acetabulum into the pelvis. Mr Astley Cooper has shewn me two specimens, in each of which the abscess had burst into the rectum.

4. In consequence of the abscess, the synovial membrane and capsular ligament become inflamed and thickened. The muscles are altered in structure ; sinuses are formed in various parts ; and at last all the soft parts are blended together

into one confused mass, resembling the parietes of an ordinary abscess.

In giving this statement, it cannot be intended to assert, that the hip is not liable to other morbid affections ; and of course, disease having its origin in the bones or soft parts may ultimately occasion destruction of the cartilaginous surfaces in this as well as in other joints ; but still the conclusion remains, that in the ordinary disease of the hip-joint, in that disease, which an intelligent surgeon, in a work written expressly on the subject, has denominated “ The Scrophulous Caries of the Hip,” the ulceration of the cartilages is the primary affection, and the other parts, in, and near, the joint, become affected only in a secondary manner.

As from the peculiar situation and connections of the hip, affections of this part are attended with particularly serious consequences, I trust that the foregoing account, will not be considered as given too

much in detail, especially as it will prevent the necessity of entering with much minuteness into the history of the ulceration of the cartilages of other joints, in which the progress of the disease, allowance being made for the difference of structure and situation, is the same as in the hip.

CASE XXVII.

David Martin, twenty-six years of age, was admitted into St. George's Hospital, on the 25th of July, 1810, on account of a disease in his right knee. He attributed it to a blow, which he had received some years previous; but he said, that the symptoms had all been much aggravated within the last six months. At the time of his admission into the hospital, the knee had the appearance of being swollen; but on examination, this was found to arise from the wasting of the muscles, rather than from actual enlargement. The

leg was fixed, or nearly so, in the half-bent position. The condyles of the femur projected beyond the head of the tibia. He complained of pain, which was particularly severe at night. An issue was made with caustic on each side of the patella ; but the symptoms were not relieved, and an abscess burst on the outside of the joint, discharging a large quantity of matter.

Soon after his admission, he experienced, for the first time, severe pain in the other knee ; but this was unattended by swelling, or any alteration in the form of the joint, and the leg admitted of complete extension and flexion on the thigh. The pain continued, but no swelling ever took place.

In the beginning of September, he was seized with an accidental attack of erysipelas. Abscesses formed in different parts of the leg and thigh ; and he gradually sunk, and died on the 7th of November.

On inspecting the body, the right leg was found bent so as to form a right angle with the thigh. The head of the tibia had been drawn towards the ham by the action of the flexor muscles, so that the condyles of the femur were unusually protuberant. The lateral ligaments were in a natural state. There were no remains of the crucial ligaments, or semilunar cartilages. The cartilages of the tibia, femur, and patella, had been entirely absorbed. The bones were carious on their exposed surfaces, but not otherwise diseased. The synovial membrane was free from all morbid appearances, except at the points of its attachment to the bones, where, in a few places, coagulable lymph had been effused on its surface.

The left knee, externally, had its natural appearance with respect both to form and size. The leg admitted of complete flexion and extension. On dissection, the ligaments and synovial membrane were found in a perfectly healthy state ;

but about one-third of the cartilaginous surfaces of the tibia and femur was destroyed by ulceration, the ulceration having taken place principally, but not entirely, near the circumference. The cartilage of the patella and the semilunar cartilages were entire, but the latter in some parts were softer than usual. The bones were free from disease. There was no pus or other fluid in the joint.

The dissection of this case, in which the ulceration of the cartilaginous surfaces was evidently the primary disease, explains well the nature of, at least, many cases of that species of white swelling, which some authors have described, in which there is long continued and severe pain in the joint, before any tumour is observable.

CASE XXVIII.

William Bowles, eighteen years of age, was admitted into St. George's Hospital,

on the 1st of December, 1810. He said that about eleven months previous to his admission, he had been seized with pain in his right knee, which was so severe as to keep him frequently awake at night. Six weeks after the pain attacked him, the joint, for the first time, became swollen. He now applied to a practitioner, under whose treatment, joined with perfect rest, the pain and swelling subsided, so that he was able to walk about. In the September following, having returned to his usual occupations, and used the joint a good deal, the pain and swelling returned.

At the time of his admission, the affected knee was about an inch and a half in circumference larger than the other. The swelling had the form of the articulating ends of the bones. The leg was half bent, and all attempts to give it motion gave great uneasiness. The pain, which he experienced, was great at all times, but particularly at night, when it very much disturbed his rest.

Soon after his admission, an abscess was discovered on the outside of the knee, which burst in the beginning of February, and discharged a large quantity of matter. On the 18th of March, the limb was removed by amputation.

On examining the joint, the greater part of the cartilaginous surfaces of the tibia, femur, and patella, were found destroyed by ulceration. Where the cartilage was destroyed, the exposed bone was carious, and in some places covered by a thin layer of coagulable lymph; but in other respects, the bone was free from disease. There were scarcely any remains of the semilunar cartilages. The joint contained pus, and the abscess in the joint had made its way into the external parts, through an ulcerated opening in the synovial membrane. The synovial membrane was in a natural state, except that, in a few places, there was a thin layer of coagulable lymph on its surface, which evidently had been recently effused.

The external lateral ligament was destroyed by the abscess: the other ligaments were entire.

In this case, the principal disease observed in the dissection, was the ulcerated state of the cartilages. There was no affection of the synovial membrane beyond what might be considered as arising from the formation of pus in the joint, and the bursting of the abscess externally. Where inflammation of this membrane is the primary disease, swelling takes place often in a few hours, always within two or three days from the beginning of the attack; whereas in this instance, the constant answer, which the patient gave to the repeated enquiries made of him, was, that he had had violent pain for six weeks before the joint was observed to be enlarged. From all these circumstances, we may conclude, that in this case as well as in the last, the cartilages were the original seat of the disease, and that the morbid appearances observed in the soft parts, were the consequence

of the formation of the abscess in the joint.

The same conclusion may be drawn respecting the two cases which follow.

CASE XXIX.

Mary Anderson, twenty-eight years of age, was admitted into St. George's Hospital, on the 6th of April, 1815.

At this time, she complained of intense pain in the right knee, which was particularly severe at night, so as exceedingly to interrupt her rest. The pain was referred principally to the head of the tibia. There was a slight swelling of the joint, having the form of the articulating ends of the bones, and not giving to the hand the smallest sense of fluctuation. The leg admitted of being moved on the thigh, but all motion aggravated the pain.

No more particular account of the

previous history of the case could be procured than the following; that she had laboured under pains of the right knee for nearly six years, which had been occasionally relieved; and that in the first instance the pain had been unattended by swelling.

Immediately on her admission, an issue was made with caustic on each side of the patella. On the 9th of April the pain had very much abated. The issues were kept open by the occasional application of caustic; and the pains very soon left her, and the swelling diminished.

About the 8th of June, she began to experience a return of the pains in the knee, and, in the course of four or five days, they were so severe as to keep her awake at night. There were convulsive startings of the limb, and the joint was swollen in a greater degree than formerly. The pains increased in violence, and her health began to suffer considerably. On the 3d of July, the limb was amputated.

On examining the knee, some lymph and serum were found effused into the cellular membrane external to it.

The cavity of the joint contained about half an ounce of thin purulent fluid. The cartilage covering the patella was, in some parts, in a natural state; in others it had the fibrous structure, which I have described in a former part of this chapter; and in others, it was completely destroyed by ulceration, so as to expose the surface of the bone. The cartilage covering the articulating extremity of the femur, presented the same variety of appearances. On the inside there was a spot of some extent, which, instead of cartilage, was covered by an organized substance, resembling the substance of adhesions, but somewhat more dense in its structure; as if the cartilage had been formerly destroyed at this part, and coagulable lymph had been effused on the ulcerated surface of bone, which had afterwards become organized.

The cartilages of the tibia were ulcerated for a very small extent.

The synovial membrane in general was in a natural state. In some places it was slightly inflamed. On the outside of the joint, it was inflamed in a greater degree than elsewhere, and thickened, and had begun to ulcerate, evidently in consequence of the abscess in the joint, having begun to make its way to the external surface.

The bones possessed their natural texture and hardness.

CASE XXX.

Jane Bannister, forty years of age, was admitted into St. George's Hospital, in September, 1810, on account of a disease in her right foot. She gave the following account of her case.

In the September of the preceding year she wrenched her instep, and soon afterwards experienced violent pain in

this part, so that she was unable to stand on that foot, and her rest was much disturbed at night. The pain continued very severe, and at the end of four months, she observed for the first time, a slight swelling on the inside of the foot. This was occasioned by an abscess, which was opened by her medical attendant in the April following.

At the time of her admission into the hospital, the whole foot was swollen, and she complained of violent pain in it. The abscess continued open, discharging a small quantity of pus. On introducing a probe into the orifice, an exposed surface of bone was felt. Several applications were made without benefit, and the leg was amputated on the 25th of February, 1811.

On examining the amputated foot, the cartilages of the joint formed by the astragalus and os naviculare were found destroyed by ulceration, and a portion of the astragalus was dead, and undergoing

the process of exfoliation. The cartilages of the joints formed by the cuneiform bones with each other, with the os naviculare, and with the metatarsal bones, were in like manner destroyed, and the exposed surfaces of bone were carious. The abscess communicated with the carious joints. The ligaments and synovial membrane were in a natural state, except in a few spots, where they were destroyed by the abscess. The bones possessed their natural texture and hardness. The cellular membrane of the foot contained coagulable lymph and serum.

It would be needless to add to the foregoing an account of other cases, in which the disease was in a still more advanced stage. The progress of it, in other joints, corresponds with that in the hip, and whatever may be the joint affected, there is ultimately the same complete destruction of the cartilages, and

the same extensive ravages are committed among the bones and soft parts.

In some cases the ulceration of the cartilage of a joint begins on that surface, which is connected to the bone, and from having observed this circumstance, I was led, at first, to adopt an opinion, which I heard stated to have been that of Mr. Hunter, and which appeared to be warranted by the small degree of vascularity which cartilage possesses, that ulceration of it takes place, not from the action of its own vessels, but in consequence of it being acted on by the vessels of the bone, to which it is connected. I afterwards found, that in many instances, previously to ulceration, the cartilage undergoes a remarkable change of texture, becoming soft, and assuming a fibrous appearance, thence I was led to conclude that this opinion is not altogether correct, and I am now able to adduce the two following

cases, which seem to prove that cartilage, as well as other parts, is capable of ulcerating from the action of its own vessels.

CASE XXXI.

A boy, twelve years of age, on the 28th of June, 1809, fell from a height, and pitched on one of his knees. When he was brought to the hospital, he was found to have a compound fracture of the femur. For some days he appeared to go on well, but afterwards an abscess formed in the thigh, extending as high as the nates ; and he sunk and died on the 21st of July. On examining the knee-joint after death, the cartilage covering the condyles of the femur, and that covering the head of the tibia were found, in some parts, entirely absorbed, so that the bone was exposed ; and in other parts it was absorbed on the surface towards the cavity of the joint, while the layer of it next to the bone retained its natural adhesion,

and its natural structure. The cartilage, in these parts, was formed into grooves, having an appearance, as if the greater portion of its substance had been removed with a chisel.

CASE XXXII.

A middle-aged man met with an injury of the knee, which was followed by inflammation and suppuration, and he died in St. George's Hospital on the 30th of August, 1809.

On examining the joint after death, the cartilage covering the condyles of the femur, and the head of the tibia, was found entirely destroyed towards the circumference, so that the bone was exposed. Elsewhere, only a thin layer of cartilage remained; but this had its ordinary texture, and adhered as firmly as usual to the bone.

As in these cases the cartilage was absorbed on the surface towards the cavity of the joint, while the remainder still adhered to the bone, it is evident that the absorption must have taken place from the vessels of the cartilage itself.

In young persons, before the period of growth is over, the articular cartilages possess more vascularity than in others, so that their vessels are distinctly to be seen, and admit of being injected, which is not the case in adults; and this explains why the ulceration of the cartilage takes place more frequently, and makes more rapid progress in the former than in the latter.

SECT. II.

On the Symptoms of this Disease.

THE ulceration of the articular cartilages occurs at any period of life, but principally in children, or in adults under the middle age. Of the whole number

of those, who have come under my own observation, labouring under this disease, not more than about one fifth were above thirty years of age; the youngest was an infant of a year old; the oldest was a woman of sixty. As the knee is more liable to inflammation of the synovial membrane, so is the hip more liable than other joints to ulceration of the cartilaginous surfaces. In general the disease is confined to a single joint; but occasionally two or three joints are affected in the same individual, either at the same time or in succession. Sometimes the patient traces the beginning of his symptoms to a local injury; but for the most part no cause can be assigned for the complaint, and often the cause, to which it is attributed, appears to be imaginary rather than real.

Where the hip is affected, the only symptoms met with for some time are pain, and a slight degree of lameness in the lower limb. The pain at first is trifling

and only occasional; afterwards becoming severe and constant. It resembles a good deal the pain of rheumatism, since it often has no certain seat; but is referred to different parts of the limb in different individuals, and even in the same individual at different periods. As the disease advances, the pain becomes exceedingly severe, particularly at night, when the patient is continually roused from his sleep by painful startings of the limb. Sometimes he experiences some degree of relief from the pain in a particular position of the joint, and in no other. A patient in St. George's Hospital never obtained any rest, except when he had placed himself on the edge of the bedstead, with his feet on the ground, and resting his body on a pillow, in a position between that of lying and sitting.

As the pain increases in intensity, it is more confined in its situation. In the greater number of instances it is referred to the hip and the knee also, and the pain

in the knee is generally the most severe of the two. At other times there is pain in the knee, and none in the hip. A boy in St. George's Hospital complained of pain in the inside of the thigh, near the middle; and another patient, a little girl, referred the pain to the sole of the foot. Wherever the pain is situated it is aggravated by the motion of the joint; but it is aggravated in a still greater degree by whatever occasions pressure of the ulcerated cartilaginous surfaces against each other. Hence the patient is unable to support the weight of the body on the affected limb; and if he be placed on an even surface, in a horizontal position, and the hand of the surgeon be applied to the heel so as to press the head of the femur against the concavity of the acetabulum, violent pain is the consequence; although this be done in so careful a manner that not the smallest degree of motion is given to the hip-joint. This circumstance is well deserving of attention; and no one should

attempt to give an opinion as to the nature of a disease connected with the hip, without having made an examination in the manner, which has been just described.

Soon after the commencement of the complaint, the hip-joint is found to be tender, whenever pressure is made on it either before or behind. The absorbent glands become enlarged, and occasionally there is a slight degree of general tumefaction in the groin. In this there is nothing remarkable, since we must suppose that, a disease going on within the articulation must ultimately occasion some degree of inflammation in the neighbouring parts. But it is a curious circumstance, that in some cases, there is tenderness of those parts, to which, though not diseased themselves, the pain is referred from sympathy with the disease in the hip. I have observed this in the knee several times, and a gentleman, in whom the pain was referred to the outside of the

leg, complained of great tenderness every where in the course of the peronæal nerve. I have also seen a slight degree of puffy swelling of the knee, where pain was referred to it, in consequence of disease in the hip. These facts correspond, to what may be observed in some other cases, where pain is referred to a sound part, in consequence of a sympathy existing between it, and some other part that labours under disease; for example, I have known the passage of a calculus down the ureter, to occasion not only pain, but tenderness, swelling, and no trifling inflammation of the testicle.

When the disease has existed for some time, the nates undergo a remarkable alteration in their form. They become wasted and less prominent: so that, instead of their usual convexity, they present the appearance of a flattened surface: they are flaccid to the touch, and hang more loosely towards the lower edge; and they have the appearance of being wider than those of the other side.

In a very few cases, in the advanced stage of the disease, the nates are really wider, in consequence of the acetabulum being filled with coagulable lymph and matter, and the head of the femur being pushed out of its natural situation. But in general the increased breadth of the nates is only apparent, and on an accurate measurement no difference will be found between the nates of one side, and those of the other. The alteration in the figure of the parts in those cases, may arise partly from the position, in which the patient usually places himself, when he stands erect; but the principal cause, to which it is to be attributed, is the wasting of the large fleshy bellies of the glutæi muscles from want of use; and this has been ascertained, by repeated, and accurate examinations of the living, and numerous dissections of the dead body.*

* This alteration in the form of the nates is a symptom, but is not in itself to be considered as a

Another symptom, which occurs in this disease, is an alteration in the length of the limb. 1st, In the early stage of the disease the patient often complains, that the limb on the affected side is longer than the other. This cannot be explained on the supposition of the acetabulum being filled with pus, or solid substance, since it would cause the head of the femur to be pushed outwards rather than downwards. The fact is that there is only an apparent, and no real elongation of the limb. If the patient be placed on his back in the horizontal position, so that both thighs make the same

certain diagnostic mark of disease in the hip-joint; as it may be observed in other cases, where, from any cause, the glutæi muscles have been for a considerable time in a state of inaction. Thus children are subject to a paralytic state of the muscles of the lower limb, and in this complaint, if the muscles are affected as high as the pelvis, the nates present to the eye the same appearance. It may be noticed also where there is disease of the thigh-bone, or where, from any other cause, the motion of the hip is painful and difficult.

angle with the pelvis, the foot on the diseased side may at first appear as much as two or three inches lower than the opposite foot ; but, if the distance be accurately measured with a tape, from the anterior superior spinous process of the ilium to the patella, no difference is perceptible. The apparent elongation is produced by the position of the pelvis being altered, in such a way that the crista of one ilium is visibly depressed below the level of that of the other. It is easy to understand how this effect is produced, by observing the position, in which the patient places himself, when he stands erect. He supports the weight of his body on the sound limb, the hip and knee of which are in consequence maintained in the state of extension. At the same time the opposite limb is inclined forward, and the foot on the side of the disease is placed on the ground, considerably anterior to the other, not for the purpose of supporting the superincum-

bent weight, but for that of keeping the person steady, and preserving the equilibrium. Of course this cannot be done without the pelvis on the same side being depressed. The inclination of the pelvis is necessarily attended with a lateral curvature of the spine, and hence it happens that one shoulder is higher than the other, and that the whole figure is in some degree distorted. All these symptoms will disappear in the course of a few weeks, if the patient under these circumstances be confined to his bed and the horizontal position ; except in some instances, where, in consequence of their having occurred in a young and growing person, and having already been allowed to exist for a considerable time, the shape of the parts has become adapted to their new situation, and the alteration of the figure may continue during life.

2. In a few cases, where the patient is in the erect position, it may be observed that the foot, which belongs to the affected

limb, is not inclined more forward than the other, but that the toes only are in contact with the ground, and the heel raised ; at the same time that the hip and knee are a little bent. This answers to the patient the same purpose of enabling him to throw the weight of his body on the other foot ; but it produces an inclination of the pelvis in the opposite direction. The crista of the ilium is higher than natural, and there is an apparent shortening, instead of elongation, of the limb on the side of the disease.

3. In the very advanced stage of the disease, when the head of the femur has been completely destroyed by ulceration, there is nothing to prevent the muscles from pulling the bone upwards. This may be compared to a case of fractured neck of the femur. The limb is not only apparently, but it is really shortened : the foot may be rotated inwards, but, if left to itself, it generally is turned outwards.

4. In other cases, the limb is shortened ; the thigh is bent forwards ; the toes are

turned inwards, and do not admit of being turned outwards ; and there is every symptom of a dislocation of the hip upwards and outwards. The following case fully explains the cause of those appearances.

CASE XXXIII.

— Taylor, a middle-aged man, was admitted into St. George's Hospital in the autumn of 1805, on account of a disease in his left hip. He laboured also under other complaints, and he died in the February following.

On inspecting the body, the soft parts in the neighbourhood of the joint were found slightly inflamed, and coagulable lymph had been effused into the cellular membrane round the capsular ligament.

There were no remains of the round ligament.

The cartilages had been destroyed by ulceration, except in a few spots.

The bones on their exposed surfaces were carious ; but they retained their natural form and size. The acetabulum was almost completely filled with pus and coagulable lymph ; the latter adhering to the carious bone, and having become highly vascular. The head of the femur was lodged on the dorsum of the ilium. The capsular ligament and synovial membrane were much dilated ; and, at the superior part, their attachment to the bone was thrust upwards, so that although the head of the femur was no longer in the acetabulum, it was still within the cavity of the joint.

Since the man did not attribute this disease to any local injury, we may conclude that the ulceration of the cartilage was the primary affection, and that the dislocation had been produced in consequence of the head of the femur having been first pushed outwards by the coagulable lymph and pus, which occupied the cavity of the joint, and then

drawn upwards by the action of the muscles inserted into the great trochanter. *

The shortening of the limb, which takes place in the advanced stage of the disease is usually, but not always, the precursor of abscess. The formation of matter is also indicated by an aggravation of the pain, by more frequent spasms of the muscles, by a greater wasting of the whole limb, and by the circumstance of the thigh becoming bent forward, and being incapable of extension, without such an increase of the patient's sufferings as he will be unable to endure. At the same time the pulse becomes quick, the tongue furred, and the whole system is in a state of preternatural excitement. The abscess usually shews itself in the

* This case affords an example of the dislocation of the hip from an internal cause, which some surgical writers have described, and it is probable that in the majority of such cases, the dislocation is produced in the same manner.

form of a large tumor over the vastus extremus muscle; sometimes on the inside of the thigh near the middle; and occasionally two or three abscesses appear in different parts, and burst in succession. The abscesses discharge a large quantity of thin pus, and in the worst cases a copious suppuration continues, until the powers of the patient are exhausted, and enfeebled and emaciated he sinks under the symptoms of a hectic fever. That an adult should recover under these circumstances is so rare an occurrence, that the surgeon can never be justified in giving any but the most unfavourable prognosis. Children recover more frequently in this advanced stage of the disease, but not without a complete ankylosis of the joint. If suppuration has not taken place, I believe it rarely happens that the limb after the cure does not regain its natural degree of mobility.*

* However difficult the diagnosis of this disease of the hip may be in its early stage, it may be made

When the cartilages of the knee are ulcerated, there is pain in the affected

with sufficient certainty, when the disease is somewhat advanced. It is to be founded however, not on a single symptom, but on the combination of symptoms, and on the history of their progress, so that no degree of experience can enable the surgeon to form his judgment correctly, without a careful investigation of the circumstances of the case before him.

The morbid affections most liable to be confounded with the ulceration of the cartilage of the hip are the following.

1. Inflammation of the synovial membrane of the hip, of which I have spoken in a former chapter.

2. Chronic inflammation of the soft parts in the neighbourhood of the hip, terminating in the formation of a chronic abscess. Here there is pain, but more confined in its situation, than where the cartilages of the hip are ulcerated: the pain is less severe; less aggravated by the motion of the joint; not relieved in the same degree by rest; not attended by a flattening, and very soon followed by a tumefaction of the nates.

3. The disease which has its origin in the cancellous structure of the bones, of which I shall speak hereafter.

4. I have seen several cases in which I suspected the symptoms to depend on a morbid condition of the sciatic nerve; and in which they bore a certain analogy to the disease in question. There was pain re-

joint; at first it is slight and only occasional, and in the early stage of the disease, it is completely relieved by remaining in a state of rest for a few days, but it returns as soon as the patient resumes the exercise of the limb. By degrees the pain becomes constant and very severe, particularly at night, when it disturbs the patient by continually rousing him from his sleep. The pain is referred principally to the inside of the head of the tibia, but sometimes a slighter degree of pain extends down the whole of that bone. The pain is aggravated by motion, so that the patient keeps the limb con-

ferred to the parts, to which the sciatic nerve is distributed; but not very severe, nor materially aggravated in consequence of the disease being neglected. There was tenderness in the situation of the nerve on the posterior part of the hip and thigh, the tenderness being usually more considerable at one particular point. The symptoms were relieved principally by the application of blisters over the trunk of the nerve, which was suspected to be the seat of the malady.

stantly in one position, and generally half bent : and he never attempts to support the weight of the body on the foot of this side.

The ulceration of the cartilages of the knee differs with respect to its symptoms, from inflammation of the synovial membrane, in this ; that the pain in the former is slight in the beginning, and gradually becomes very intense, which is the very reverse of what happens in the latter. But there is another circumstance, which forms a remarkable distinction between the ulceration of the cartilages, and most other diseases, to which this joint is liable. The pain in the first instance is unattended by any evident swelling ; which comes on, never in less than four or five weeks, and often not until several months have elapsed from the commencement of the disease. The reason of this is too manifest to require explanation, and it is equally unnecessary to point out the importance of it, as affording the means of

making a more ready diagnosis. We must not indeed conclude indiscriminately, whenever there is a slight pain in the knee, unattended by swelling, that the cartilages are in a state of ulceration, since this symptom may equally arise from inflammation of the bones themselves; of the ligaments; of the fatty substance of the joint, or from simple nervous affection; and instances will occur to every surgeon, where there is reason to believe that the above mentioned symptom arises from one or other of these causes. But when the pain continues to increase, and at last becomes very severe; when it is aggravated by the motion of the joint, and by the pressure of the articulating surfaces against each other: and when after a time a slight tumefaction takes place, such as I shall presently describe; we may conclude that the disease consists in an ulceration of the cartilages; and in all such cases, which have come under my own

observation their subsequent progress, and the morbid appearances presented by dissection, where an opportunity has occurred of observing them, have fully justified this conclusion.

The swelling, which attends this disease in the knee, differs from that, which occurs in either of those of the synovial membrane, which I have formerly described. It arises from a slight degree of inflammation having taken place in the cellular membrane external to the joint, in consequence of the disease within it. The swelling is usually trifling, appearing greater than it really is, in consequence of the wasting of the muscles of the limb. It has the form of the articulating ends of the bones ; that is the natural form of the joint. No fluctuation is perceptible, as where the synovial membrane is inflamed : nor is there the peculiar elasticity, which exists, where the synovial membrane has undergone a morbid alteration of structure.

But a few cases occur, in which this

disease is attended with a collection of fluid in the joint, and in which therefore the tumor has a form different from that which has been described, and giving to the hand a distinct sense of fluctuation.

1st, Inflammation of the synovial membrane may occur as a secondary disease, ulceration of the cartilages having preceded it, and the effusion of synovia into the joint being the consequence of it. This I supposed to have happened in the case of John Child, which will be related hereafter.

2dly, In an advanced stage of ulceration of the cartilages, where an abscess is formed, it occasions ulceration of the soft parts, and usually makes its way to the skin ; but sometimes the pus is collected in the joint, distending the synovial membrane, and causing a tumor very similar to that, which would arise from it being distended with synovia. In these cases, the surgeon must form his diagnosis, by attending to the previous

history ; by observing the degree and the kind of pain of which the patient complains ; and the state of his general health ; and by bearing in mind this circumstance, that blisters very seldom fail in procuring absorption of the too abundant synovia, and that they never cause the absorption of pus.

As the ulceration of the cartilages is sometimes followed by dislocation of the hip ; so we find that dislocation of the knee occasionally takes place from the same cause. Where there has been considerable distention of the soft parts in consequence of ulceration extending to them, the head of the tibia is gradually drawn backwards by the action of the flexor muscles and lodged in the ham ; and I have even known this to happen where abscess has never formed, the patient ultimately recovering with a stiff joint and disfigured limb. In such a case, the condyles of the femur make an unusual projection, and the articulating

surfaces of the bones are partially or entirely separated from each other.

The symptoms produced by the ulceration of the cartilages of other joints correspond very nearly with those already described. The principal diagnostic mark is the pain, which is experienced in the beginning unattended by swelling. The pain is referred to the part, which is the actual seat of the disease : but where the elbow is affected, the more violent pain in this joint is accompanied by a slighter degree of pain in the lower part of the fore-arm and wrist ; and where the disease is in the shoulder there is often a painful sensation, extending down the whole of the bone of the arm. In all cases the pain is much encreased, when the articulating surfaces are pressed against each other, and in the first instance it is unattended by swelling. In cases of ulceration of the cartilages of the shoulder, the joint is smaller than natural, in consequence of the wasting of the deltoid muscle.

Whatever joint is the seat of the disease, the formation of abscess is always attended with an aggravation of all the symptoms. But the degree, in which the general system is disturbed, when suppuration is established, depends on various circumstances ; on the age and powers of the patient ; on the size of the affected joint ; and on its situation. An abscess connected with a deep-seated joint occasions more extensive mischief of the soft parts, before it reaches the surface, and therefore is productive of more serious consequences, than one which is connected with a joint, that is situated superficially.

The progress of the ulceration of the cartilages varies, with respect to time, in different cases, but it is generally tedious. In one case, where violent pain had existed in the knee, with little or no swelling, for two years and a half previous to amputation, I had an opportunity of examining the diseased joint, and found the cartilages destroyed for only a small

extent; a dram and a half of pus in the articular cavity, and no morbid appearances of the soft parts, with the exception of a very slight inflammation, which had been induced in the synovial membrane, and the effusion of a minute quantity of coagulable lymph into the cellular texture on its external surface. In another case, the pains in the lower limb had existed for a whole year, before they were sufficient to attract the patient's serious attention. In this case no pus was formed in the joint; and the ultimate recovery was complete, without the smallest detriment to the motion of the limb. Sometimes, however, the progress of the disease is much more rapid. There was a patient in St. George's Hospital, in whom, in the course of four months, the destruction of the head of the femur and acetabulum was such, as to occasion a real shortening of the limb to the extent of an inch.

SECT. III.

On the Treatment.

WHERE the cartilages of a joint are ulcerated, it may well be supposed that the motion of their surfaces on each other must be favourable to the progress of the ulceration. I have known some cases, in which rest alone was sufficient to produce a cure. In all cases the symptoms of the disease are aggravated by any considerable exercise; and we may therefore conclude that the keeping the limb in a state of perfect quietude, is a very important, if not the most important, circumstance to be attended to in the treatment.

Issues made with caustic * have been

* The immediate relief, which sometimes follows the application of caustic to the skin, or the surface of an issue, when the limb is under precisely the same circumstances, as before, with respect to rest; and the return of the symptoms, which in many instances follows the early healing of an issue, suffi-

recommended by many practitioners for the cure of diseased joints ; but as far as I know, no one has attempted to point out the particular class of cases, to which this remedy is applicable. I have employed caustic issues, and seen them employed, in a great number and variety of instances, and have found them to be usually productive of singular benefit,

ciently prove the efficacy of this remedy. It may be difficult to explain the *modus operandi* ; but what happens in these cases seems to bear no distant analogy to the suspension of gonorrhœa, by the occurrence of inflammation of the testicle, or the metastasis of gout from the stomach to the foot. Issues are employed in surgery for the purpose of stopping the morbid actions of the animal body : but it is probable that if made of too great an extent, they would interfere with its natural actions also. In a guinea-pig, a large abscess took place of one leg and thigh in consequence of a local injury. The formation of the abscess completely stopped the growth of the claws on the foot of this side. They wore away at the points, without being regenerated at the base, became short and dry, and readily cracked and splintered ; while on the foot of the opposite limb they continued to grow as usual, and possessed their ordinary appearance.

where the cartilages are in a state of ulceration, and to be of little or no service in any of the other morbid affections, to which the joints are liable. Setons and blisters kept open by means of the savine cerate appear to operate nearly in the same manner as caustic issues, and may be used with advantage in the same description of cases. *

In many instances, which occur particularly in hospital-practice, the patient, from too freely exercising the limb, brings on an inflammation of the ulcerated surfaces of the bones, occasioning an aggravation of the pain, and usually some degree

* It may be expected that I should in this place offer some remarks on the effects of the application of the cautery, which has been recommended at different times, for the relief of some cases of diseased joints. I do not however feel myself warranted in giving any confident opinion as to the comparative efficacy of issues made by the caustic, and those made by the cautery; my experience of the latter being very limited. The little, which I have had an opportunity of observing, has certainly not led me to prefer the cautery to the caustic.

of fever ; and here bleeding may be employed with advantage. Under other circumstances I have not known the loss of blood to be productive of much benefit. Indeed I know of no analogy, that should lead us to expect much benefit from it, since bleeding is not found to possess the power of stopping the progress of ulcers in other parts.

In the early stage, the warm bath is sometimes of service. At least it is capable of relieving the symptoms, if not of stopping the progress of the disease.

Plasters made of gum ammoniac, and others of a similar nature ; embrocations and liniments of all kinds, are entirely inefficacious. Friction is invariably injurious.

I have shewn in a former section that ulceration of the articular cartilages may take place to a considerable extent, without suppuration being established. This is a circumstance of much importance, not only with respect to pathological science, but also in a practical point of

view. The prospect of a cure, which the employment of any remedies affords, is undoubtedly much greater where abscess does not exist, than where it does; and the prognosis which the surgeon gives must depend in a great degree on the opinion, which he is led to form on this subject.

Having premised these general observations, I shall proceed to offer a few practical remarks: first, on the treatment of this disease in the hip, and afterwards in other joints, without reference to suppuration having taken place; secondly, on the plan which should be adopted, where suppuration is established, and there is a collection of pus communicating with the articular cavity.

Where the cartilages of the hip are ulcerated, the patient should, in the first instance, be confined to a couch, if not to his bed; and if the disease be far advanced, the limb should be supported by pillows and cushions properly

disposed, so as to favour the production of ankylosis, by allowing it to vary as little as possible from one position.

In young children, blisters are capable of affording complete relief. They may be applied on the nates, round the great trochanter, and in the groin. A blister kept open by means of the savine cerate is usually more efficacious than a number of blisters applied and healed in succession.

In children above the age of eight or ten years, and in adults the same treatment is useful in the very early stage of the disease; but in the more advanced stage, issues made with caustic appear to be much more efficacious, and to be attended on the whole with less inconvenience to the patient.

The hollow behind the great trochanter of the femur, is in many respects the most convenient situation for the application of the caustic; but in some cases the application of it on the outside of

the hip is attended with better effects. The skin of this part is in fact nearer to the joint, than the skin behind ; and there are some grounds for the opinion, that issues are more efficacious, when made near to the seat of the disease, than when made at a distance from it. * The skin in the groin is still nearer to the hip than on the outside, but the large vessels and nerves of the thigh forbid the use of the caustic at this part. A slough may be

* “ I have for many years applied caustics above
 “ and below the internal condyle of the thigh-bone,
 “ for white swellings of the knee, with various success ;
 “ and I have remarked, that where this plan disap-
 “ pointed my hopes, and where a suppuration took
 “ place in the joint, that the inflammation in almost
 “ every case arose, and that the matter collected
 “ generally made its way, outwards on the external
 “ side of the knee. Observing this fact repeatedly,
 “ I was led to believe that the caustic, in the manner
 “ I used it, checked the progress of the disease, as
 “ far as it had influence ; but that the influence was
 “ not sufficient to pervade the whole cavity of the
 “ joint.”

Ford on the Hip-Joint, p. 194., first edition.

made with the *potassa fusa*, in the adult, half an inch in breadth and two inches in length behind the great trochanter. If this fails in giving relief, a second slough of a smaller size may be made on the anterior edge of the tensor vaginæ femoris muscle; and in some instances, though no relief is afforded by the first issue, there is great relief from the second.

The good derived from the issue does not seem to be in proportion to the quantity of pus discharged from its surface. It has been observed by others, that sometimes more abatement of the symptoms is produced in the first few days after the caustic is applied, and before the slough has separated, than in several weeks afterwards. This circumstance first led me, instead of employing beans for this purpose, to keep the issue open simply by rubbing the surface with the caustic potash, or with the sulphate of copper, twice or three times in the week; and after an extensive trial of

both methods, the latter has appeared to be decidedly preferable to the former. The pain produced by the caustic is very considerable, but the relief of the symptoms is such, that I have known patients to be in the habit of making the application themselves, saying that “ they knew they should be better by the next morning.” Besides, the issue is more easily dressed than where beans are used ; and the inconvenience arising from the beans slipping out under the adhesive plaster, and from any accidental pressure of them against the sore surface, is avoided.

The cases, in which complete relief of the symptoms immediately follows the making the issue, are not very numerous. In general, there is some degree of abatement on the caustic being applied ; and in a few weeks afterwards (provided that suppuration has not taken place), if the patient continues in a state of quietude, the pain entirely leaves him. Where the pain is exceedingly severe (as it sometimes

is, so as to prevent sleep during many successive nights), it is very desirable that some method should be adopted, capable of affording more speedy relief, than that, which can usually be obtained from the application of the caustic. If there is reason to believe that the ulcerated surfaces are in a state of inflammation, in consequence of the joint having been too much exercised, bleeding may be had recourse to. A blister may be applied to the groin, and repeated if necessary. Blisters applied to the knee, or to the thigh, though there is no actual disease in these parts, will often occasion considerable or even entire relief of the pain, which is referred to them, from sympathy with the affection of the hip. This is a curious circumstance, but I have known it happen in so many instances, that, however difficult it may be to explain it, I can entertain no doubt of the fact. Sometimes the pain is altogether relieved by the application of the blister; at

other times, I have known it leave the knee, to which the blister was applied, and attack the hip.

The objections, which may be urged against the application of caustic to the skin in the groin, do not hold good with respect to a seton in this situation. I was led to adopt this treatment some years ago, partly from observing that the skin of the groin is nearer to the hip-joint, than the skin elsewhere; partly from an expectation (though not a very confident one), that the making a seton over the trunk of the anterior crural nerve, might be particularly calculated to relieve the pain referred to those parts, to which the branches of that nerve are distributed. The results of this practice more than realized whatever hopes I had entertained of its success. In many cases the seton occasioned very speedily a complete relief of the pain. In other cases indeed, it failed in producing the like good effects; but these cases have

borne only a small proportion to those in which it has succeeded. On the whole, I am led to conclude, that where the pain is very severe, the seton in the groin is more calculated to afford immediate relief than the caustic issue ; but that it is not equally efficacious in checking the progress of the disease, as in lessening the violence of its symptoms ; and that the caustic issue can be better depended on for the production of a cure. *

* The following are extracted from notes, which were taken formerly, when I was making observations on this subject.

“ November, 1808.

“ Martha Atkinson, fifteen years of age, laboured under symptoms of ulceration of the cartilages of the hip. She had pain in the hip and knee, but that in the hip was the most severe of the two. Her sufferings were such that she could scarcely venture to make the slightest alteration in her position ; and she could scarcely procure any rest at night.

“ November 20., a seton was made in the groin.

“ November 22., the pain in the hip was almost completely relieved ; and from this time she mended rapidly.”

To make the seton in the groin it is convenient to use a curved seton-needle.

“ John Selly, eleven years of age, was admitted into St. George's Hospital on the 28th of December, 1808, with severe pain in the hip and knee; tenderness in the region of the hip, and enlargement of the glands in the groin.

“ December 30., a seton was made in the groin.

“ The pains in the hip and knee were almost completely relieved within a few hours after the seton was introduced. The relief was permanent, and on the 24th of May following he left the hospital as cured.”

“ Susan Dean, about twelve years of age, was admitted into St. George's Hospital, in November 1808, with very severe pains in the hip and knee, in consequence of disease in the former joint. A large abscess presented itself on the upper and outer part of the thigh.

“ On the 4th of December a seton was made in the groin. The pains were relieved on the same afternoon. She had no return of pain, while she continued in the hospital, but as her friends took her away in a few weeks after the seton was made, I had no opportunity of observing the termination of the case.”

“ James Craven, a young man, was admitted an out-patient of St. George's Hospital on the 15th of March 1809, with the usual symptoms of ulceration

In the majority of cases, the patient keeps the thigh considerably bent on the pelvis ; and this position of the limb makes it difficult to employ a needle of the usual form. The seton may be introduced obliquely on the anterior part of the joint, including from one inch and a half to two inches of integuments. After some time the skin over it usually inflames and ulcerates, and the seton drops out ; but this does not happen before it has produced all the benefit which may be expected from it.

of the cartilages of the hip. There was a large abscess on the outside of the thigh, and intense pain in the knee preventing his rest at night.

“ March 16., a seton was made in the groin. Being unable to become an in-patient of the hospital, he walked home afterwards. Nevertheless the pain was completely relieved in a few hours : and he slept soundly at night, the pain not at all disturbing him.

“ After this the abscess burst, and collected again several times ; and he became affected with hectic symptoms. I did not see the termination of the case, but I make no doubt of it having ended fatally.”

Of the above observations on the ulceration of the cartilages of the hip, many are applicable to the disease in other joints. In all cases, a state of the most perfect quietude is indispensable. If the disease be in the lower extremity, the patient should be confined to the horizontal position ; if in the upper, the arm should be supported in a sling. Where the knee or elbow is affected, we may employ the caustic issue, or the blister kept open by means of the savine cerate, but the former appears to be the most efficacious of the two. In the knee, a narrow slough may be made by rubbing the skin with the *potassa fusa* on each side of the patella ; and, in the elbow, the caustic may be applied in the same manner on the inside, and on the outside of the joint. When I have met with this disease in the shoulder, I have sometimes employed a large blister, and kept it open by means of the savine cerate ; and in other cases I

have made two caustic issues, one on the anterior, the other on the posterior part of the joint; and, on the whole, the caustic issues have appeared to be productive of better effects than the blister. Where the disease has its seat in those joints, which are surrounded by numerous tendons, as the wrist and ankle, it may be more prudent to employ the blister, lest injury should be done to the superficial tendons by the application of the caustic. I have, however, in a few cases, made a caustic issue below the internal or external malleolus. It has produced the best effects with respect to the disease in the ankle, but has been attended with unusual irritation and distress to the patient, so that it was with difficulty that he could be induced to allow it to be kept open for a sufficient length of time.

I have seen several cases, in which the caustic issue has in the first instance removed all the symptoms of the disease, and yet after some time, notwithstand-

ing the patient has remained in a state of perfect quietude, and there has been no evident cause of aggravation, they have returned nearly in the same form as before, and with their original severity. In some of these cases, their recurrence is to be attributed to the issue itself; which from some cause, that the present state of our knowledge does not enable us to explain, produces an effect, apparently the opposite to that, which it produced when it was first made. The issue being allowed to heal, the symptoms again subside, and perhaps the patient may find himself entirely and permanently relieved before the sore is completely cicatrized. The same thing may be observed, perhaps more frequently, where a blister has been long kept open by means of the savine cerate; and here, if the blister be of a large size, the recurrence of the pain is usually attended with a quick pulse, and a furred tongue, and much constitutional irritation, of all which the patient is re-

lieved, when the blistered surface is allowed to skin over. It is evident that it is of much importance, and also that it may require considerable discrimination on the part of the surgeon, to distinguish when the issue or the blister begins to be injurious, and ought therefore to be persevered in no longer.

In other instances, where the symptoms have returned under the use of the caustic issue, it has appeared to me that this was to be explained in a different manner. A very small quantity of matter has been formed by the ulcerated surfaces of the joint, but not sufficient to prevent the application of the caustic from producing in the first instance very considerable benefit. But having once begun, the suppuration has continued, until a sufficient quantity of pus has been collected to occasion distention of the joint, and the reproduction of the former symptoms, in spite of the remedy, which before relieved them. Such cases are

not of very unfrequent occurrence, and they shew that the surgeon should not incautiously give a very favourable prognosis in the first instance, because the immediate effects of the issue have been beneficial ; but that he should wait and observe, whether these good effects continue, before he ventures positively to predict his patient's recovery.

The treatment of the abscess, which arises from this disease in a joint, makes a question of very serious importance, but more so as it regards children, than adults ; since the former may, and do frequently, recover, even after an extensive suppuration has taken place ; whereas, this is a very rare occurrence in a grown-up person. *

* It is to be observed that I speak here only of the abscess in a joint, which is the consequence of ulceration of the cartilage occurring as a primary disease.

I have not found that the method of evacuating the matter, which has been recommended by Mr. Abernethy, in his treatise on the lumbar abscess, is attended with any particular advantage in a case of carious joint. Indeed this corresponds with what a little consideration might lead us to expect. If an abscess takes place as a primary affection, the disease being confined to the soft parts, there may be nothing to prevent the contraction of the cyst, and gradual diminution of the quantity of pus evacuated at each puncture. But where an abscess occurs, in consequence of an ulcerated state of the articular cartilages and bones, as the cause of the abscess exists equally after, as before the puncture, the suppuration will necessarily be kept up, and the contraction of the cyst, and the obliteration of its cavity, will be prevented.

In some instances I have been led to believe, that, after the application of the caustic, the tumor formed by the abscess

has diminished in size, as if from an absorption of a portion of its contents. I have however seen no instance of complete absorption having taken place, though I have made various attempts to produce so desirable an effect. Emetics, whether they were given to excite vomiting, or only in nauseating doses, were, in my experiments, of no service. Electricity was never useful; appearing rather to occasion a more rapid accumulation of matter. Knowing that pressure, under certain circumstances, causes an increased action of the absorbent vessels, in two cases I applied stripes of adhesive plaster round the limb, with the view of trying the effects of pressure on the contents of the abscess. The consequence was a speedy diminution of the external tumor; but I afterwards found that this arose, not from any absorption having taken place, but simply from the increased resistance on the surface causing the abscess

to occupy a larger space in the interior of the limb.

The early puncture of an abscess connected with a diseased joint is certainly not to be recommended. I have always observed that such an abscess has healed more readily, and that the opening of it, (whether by a natural process, or by the lancet,) has been attended with fewer ill consequences, where the patient has been kept for some time in a state of perfect quietude, and the other methods of treatment, formerly mentioned, have been previously resorted to, than where it has taken place immediately on the patient coming under the care of the surgeon. Nor is this difficult to explain: in the latter case, at the bottom of the abscess there is a carious or ulcerated surface of bone; in the former, it is highly probable, that the process of cure has already begun, and that where there was diseased bone before, there is now a granulating surface. At any rate it cannot be sup-

posed, that when, in consequence of the neglect of the disease, the ulcerated bones as well as the other parts, are in a state of inflammation, the abscess can be under such favourable circumstances for being opened, as when such inflammation has been previously allowed to subside, under rest, and the employment of proper remedies.

An abscess connected with any joint, but particularly one connected with the hip, does not form a regular cavity, but usually makes numerous and circuitous sinuses in the interstices of the muscles, tendons, and fasciæ, before it presents itself under the integuments. It is therefore less easy to evacuate its contents, than those of an ordinary lumbar abscess ; and indeed it can seldom be emptied, without handling and compressing the limb, in order to press the matter out of the sinuses, in which it lodges. But this is often attended with very ill consequences. Inflammation takes place of

the cyst of the abscess, and pus is again very rapidly accumulated. Small blood-vessels give way on its inner surface, the bloody discharge of which, mixed with the newly-secreted pus, goes into putrefaction, and exceedingly irritates the general system. I have seen cases, where, after a great deal of pains having been taken to obtain the complete evacuation of the contents of the abscess, and the puncture having healed, in a few days the tumor has become as large as ever, attended with pain in the limb, and a fever resembling typhus in its character, and threatening the life of the patient. A second puncture having been made, a quantity of putrid foetid pus, of a reddish brown colour, has escaped; the confinement of which had produced all the bad symptoms, which have been immediately relieved by its evacuation.

The practice, which has appeared to me to be, on the whole, the best, is the following. An opening having been made

with an abscess lancet, the limb may be wrapped up in a flannel wrung out of hot water, and this may be continued, as long as the matter continues to flow of itself. In general, when a certain quantity has escaped the discharge ceases ; the orifice heals, and the puncture may then be repeated some time afterwards ; but where the puncture has not become closed, I have seldom found any ill consequences to arise from it remaining open.

I have already observed that the prognosis, which the surgeon is led to form, must depend very much on the circumstance of suppuration having, or not having taken place. The formation of even the smallest quantity of pus in the joint, in cases of this disease, in the young person considerably diminishes, and in the adult very nearly precludes, the possibility of any ultimate good being derived, except from amputation. On the other hand, where abscess has not begun to form,

there is perhaps no disease, among those, which come under the care of the surgeon, in which he can employ his art, with a better prospect of success than this. It is to be observed however that the symptoms may be relieved, while there are still some remains of the disease: or, at any rate, while there is still a disposition to relapse; and in order that the cure should be permanent, it is necessary that the treatment should be employed for some time after the patient is apparently recovered. A gentleman who had long laboured under ulceration of the cartilages of the hip, finding himself to be free from all uneasiness, allowed the issue to be healed. This was attended with no immediate ill consequences; but in the course of two or three months he began to experience the well-known symptoms of his former complaint. A caustic issue was again made, and he was again relieved. The issue was kept open for

twelve months longer and then healed. When I last saw him, two or three years after the healing of the issue, he continued perfectly well. This however is only one of many cases, which might be quoted in proof of the above observation.

When the ulceration of the cartilages has made very considerable progress, if the patient recovers, so as to preserve the limb, he seldom has the use of the joint afterwards, the bones composing it being united by ankylosis; but if it has been checked in a less advanced stage, even though there is reason to believe that the cartilages have been extensively destroyed, the patient may retain the natural motion of the joint. I have not hitherto examined any cases, in which it appeared, that there had been an attempt at the regeneration of the absorbed cartilages: and I have occasionally been

able both to feel and to hear the hard surfaces of the bones grating against each other in the motion of the joint, in such a manner that it was evident that they had no cartilaginous coverings. In some instances a compact layer of bone is formed on the carious surface, nearly similar to what is seen in the healthy bone, after the cartilage has been destroyed by maceration. I have many times, in dissection, observed a portion of the cartilage of a joint wanting, and in its place, a thin layer of hard, semi-transparent substance, of a grey colour, and presenting an irregular granulated surface. It is probable that in these cases, the original disease had been ulceration of the cartilages. In a subject in the dissecting room, I found no remains of cartilage on the bones of one hip; but in its place, a crust of bony matter was formed, of a compact texture, of a white colour; smooth, and having an appearance not very unlike that of

marble. I suspected this also to have been a case, in which the patient had recovered, after ulceration of the cartilage; and this opinion was rendered more probable, by the following case, which afterwards occurred.

CASE XXXIV.

A woman, thirty-six years of age, was admitted into St. George's Hospital, with pain in the hip and knee on one side. The nates were wasted and flattened, and a large abscess had burst, leaving a sinus communicating with the hip-joint. She was affected with hectic fever, and gradually sunk and died.

On inspecting the body, various sinuses were found in the neighbourhood of the hip and communicating with it.

The synovial membrane and capsular ligament had undergone no alteration in their appearance, beyond what evidently

depended on the abscess. The cartilage was every where absorbed from the articulating surfaces, and in its place there was a white polished surface, similar to that, which has been just described.

SECT. IV.

Cases of this Disease.

THE following cases, which are taken from many similar, of which I have preserved notes, are intended to illustrate the observations, contained in the two last sections. There seems to be no doubt that the disease was ulceration of the articular cartilages, since the symptoms exactly corresponded with those, which have been observed in cases of this description, in which an opportunity occurred of examining the morbid appearances after death, or after amputation. It will be observed that I have not selected cases, in which the disease was

situated in the hip: nor, in which it had reached its most advanced stages: my reasons for which have been, that a sufficient number of examples of this affection of the hip, may be found among the cases already published by Mr. Ford, and other writers: and that it is in the early stage of the disease that it principally deserves to be studied, and that the diagnosis is of the most importance.

CASE XXXV.

Mary Jenkins, twenty-one years of age, in May, 1809, received a blow on one of her knees. Soon afterwards she was seized with pain in the joint, which gradually became more severe. In September of the same year, she was admitted into St. George's Hospital, on account of this, and of some other complaints, which required medical treatment. At first she was under the care of Dr. Bancroft. On the 9th of November, she

came under the care of the surgeons. At this time, the knee was somewhat swollen ; the swelling having the form of the articulating ends of the bones, and appearing greater than it really was, on account of the wasting of the muscles of the limb. No fluid was perceptible in the joint. She complained of violent pain, which she referred chiefly to the inside of the head of the tibia, and which was extremely aggravated by motion. There was no redness of the skin. She was emaciated, and laboured under a slight degree of hectic fever.

An issue was made with caustic on each side of the ligament of the patella. The issues were kept open by means of peas : their surfaces being also rubbed with caustic every fourth day.

At the expiration of a fortnight the pain was very much abated : she was able to give some motion to the joint without much uneasiness. The swelling had nearly disappeared.

In a short time the pain was completely relieved; however she did not quit the hospital until the September of the following year. At this time she was free from all bad symptoms, and had recovered the perfect use of the joint.

CASE XXXVI.

John Reade, twenty-eight years of age, applied for relief as an out-patient of St. George's Hospital on the 4th of October, 1811.

He said, that for two years preceding he had been subject to pains in the elbow, which were occasionally severe, but attended with little or no swelling. At the time of his coming to the hospital, the pain in the joint was very violent, particularly at night, when it continually roused him from his sleep. There was also pain in the shoulder and wrist, but trifling, when compared to that in the elbow, and only occasional. The elbow

was slightly swollen, the swelling having the form of the articulating ends of the bones, and arising, not from fluid within the joint, but from inflammation having extended to the cellular membrane external to it. The fore-arm was kept bent, and all attempts to move it from this position caused a severe aggravation of the symptoms. There was some degree of symptomatic fever.

Eight ounces of blood were taken from the other arm, which occasioned some, but not considerable relief.

October 8th. A caustic issue was made on each side of the joint.

October 11th. He was free from the symptomatic fever; the pain in the shoulder and wrist had entirely left him; that in the elbow was much diminished.

October 16th. The sloughs were separated. The issues were afterwards kept open by the occasional application of caustic. He now made very little complaint of pain, and slept well at night.

From this time he experienced very little uneasiness. He gradually recovered the use of the elbow, and in a few weeks, finding no inconvenience from the complaint, he ceased to attend at the hospital.

CASE XXXVII.

Anne White, twenty-one years of age, was admitted into St. George's Hospital on the 8th of January, 1814.

She said, that three months before her admission she was seized with pain of the left knee. The pain was slight at first, but gradually increased in violence. In less than a month after the pain first attacked her, the joint became slightly swollen. About a fortnight before her admission, she was seized with a pain in her left elbow unattended by swelling.

At the time of her applying at the hospital, the knee was swollen, but only in a slight degree. The swelling had the form of the bones of the joint,

arising from an effusion into the cellular texture, and not from fluid within the synovial membrane.

During the day she had violent, but not constant pain in the knee; the pain attacking her by fits, which lasted a few minutes. During the night, the pain was more constant, and very severe, so as to disturb her rest exceedingly. The pain, when most violent, extended up the thigh and down the leg. The joint was capable of motion, but all motion aggravated the pain. There was great tenderness on the inside of the knee. The skin was somewhat redder than natural, but the redness was greater at one period than at another.

She complained also of pain in the elbow, extending up the arm and down the fore-arm. This joint was not at all swollen. She had lost flesh: had a white tongue, quick small pulse, and was occasionally flushed.

Immediately on her admission leeches were applied to the knee, which some-

what relieved the pain in this joint. On the 11th of January a caustic issue was made on each side of the elbow: and on the 13th of January an issue was made on each side of the knee.

On the 17th of January the pain in the elbow was almost completely relieved: that in the knee was somewhat less.

The issues were kept open by the occasional application of caustic. The pain and swelling of the knee gradually subsided, and she recovered her health. The issues were not healed until the end of May, at which time the swelling of the knee had subsided, and there was no pain either of the knee or elbow.

CASE XXXVIII.

A gentleman, twenty-four years of age, about the end of the year 1816, became affected with a slight pain in the left ankle; and he observed also that this pain was particularly aggravated, whenever any

thing occurred to press the articulating surfaces of the joint against each other ; for example, when he happened to tread with his heel on any projecting stone in the street. He also observed a very slight degree of puffy swelling on the anterior and outer part of the joint, before the external malleolus.

On the 6th of January, 1817, he went to a ball and danced ; and on the following day the pain was very much aggravated. The exercise also brought on some degree of general tumefaction about the joint, which however subsided with rest, in the course of twenty-four hours. But the pain continued and increased ; so that he could not support the weight of his body on that foot, and he was compelled to walk with the assistance of one, and afterwards of two sticks. In May following, a general puffy swelling took place round the whole joint, which did not subside.

On the 30th of June, 1817, he consulted me, being then in the following condition.

There was some degree of general œdematous tumefaction of the whole joint, in consequence of slight inflammation of the cellular membrane external to it. There was a constant and severe pain referred to the ankle, which was rendered more violent, when he attempted to stand, and when the cartilaginous surfaces were pressed against each other, by the hand placed on the lower part of the heel. His rest was disturbed at night, by painful startings of the limb.

He had come to consult me at my own house, and in going home, he fell from his horse, and wrenched his ankle, which brought on inflammation, and rendered all the symptoms still more severe.

He was directed to remain at home, in a state of perfect quietude, and never to place the foot on the ground. Leeches and cold lotions were applied, and the leeches were repeated. Under this treat-

ment the additional inflammation induced by the accident subsided ; and the pain became much less severe. At the end of August, a blister was applied on each side of the ankle, and kept open by means of the savine cerate. After the first blisters were healed, others were applied, and kept open in the same manner, and in the intervals between the applications of the blisters the joint was bound up in stripes of linen spread with soap cerate plaster.

About the end of September he was so much relieved that (having some concerns which it was of much importance to himself to attend to,) he was allowed to go out occasionally in a chaise.

On the 20th of December, a caustic issue was made behind the inner ankle. This occasioned exceeding irritation and uneasiness, and the issue was in consequence allowed to begin to heal, about a fortnight after the separation of the slough. He was however much benefited

by the issue ; and after it was healed, he was free from pain, and the swelling had subsided.

On the 23d of May, 1818, he was in the following condition. He was free from all pain ; could bear the joint to be moved, and could support the weight of the body on that foot without inconvenience. There were still some slight remains of the external swelling. When the joint was moved, a grating sound could be heard ; and if at this time the fingers were applied to the joint, a sensation was communicated to them, as if two hard and rough surfaces were rubbed one against the other.

CASE XXXIX.

Mary Taylor, fifty years of age, was admitted into St. George's Hospital, on the 3d of December, 1809.

She said, that in the preceding July she had a violent wrench of the right

shoulder, in consequence of her husband having pulled her by the arm. Soon afterwards she was attacked with pain in this joint, which gradually became very severe. At the time of her admission into the hospital, there was no alteration in the external appearance of the shoulder. There was not the smallest evident swelling ; but she complained of constant and violent pain, which was much aggravated by every attempt to move the arm. The pain was most severe at night, so as very much to disturb her rest. She was unable to lie on the side, on which the disease was situated.

The arm was supported by a sling, and a blister was applied to the shoulder, and afterwards kept open by means of savine cerate.

In less than a fortnight the symptoms were much relieved. In the beginning of January, 1810, she had very little pain, and slept well at night. About the middle of February she was dismissed from the

hospital, being free from all her former symptoms. She was directed to attend as an out-patient, that the blister might be kept open for some time longer; however she never made her appearance at the hospital again, probably in consequence of her finding no inconvenience from the complaint, and of her not being convinced of the necessity of continuing the treatment after the symptoms were relieved.

I have before observed that ulceration of the articular cartilages is not unfrequently complicated with inflammation of the synovial membrane. Sometimes the one, and sometimes the other is the original disease, in like manner as we find ulcer of the cornea of the eye in some cases the cause, and in others the consequence, of inflammation of the tunica conjunctiva. In the very advanced stage, when the organization of the joint is

completely destroyed, this complication must always exist: and it is unnecessary to adduce evidence of this fact. But occasionally the two diseases are combined together in a more early stage, and previous to the establishment of suppuration.

In the following case, which is related for the purpose of illustrating this subject, ulceration of the cartilage appears to have been the primary, and inflammation of the synovial membrane the secondary affection: at least the symptoms which occurred are better explicable on this supposition than on any other.

CASE XL.

John Child, thirty-three years of age, in April, 1814, was seized with a pain in one knee, the pain at first was slight, but gradually became very severe. It was referred principally to the head of the

tibia on each side of the ligament of the patella. At the end of five months, the joint for the first time became swollen, and the swelling soon attained a considerable size. He was now under the necessity of confining himself to his room. Five blisters were applied in succession, and the swelling and pain subsided, so that at the end of three weeks he returned to his usual occupations. In five or six days however the pain and the swelling returned, and he was in consequence admitted into St. George's Hospital on the 26th of October.

At this time he complained of pain in the joint, referred to the head of the tibia, on each side of the ligament of the patella. The pain was excruciating, so as often to keep him awake during the whole night. The knee was much swollen: the swelling arising from an effusion of fluid into its cavity, and having the same form as in ordinary cases of inflammation of the synovial membrane.

October 29. A blister was applied including the greater part of the circumference of the joint.

November 7. The swelling and pain were relieved. Another blister was applied, which was kept open with the savine cerate until the end of the month. It was then healed, and a third blister was applied and kept open in the same manner.

On the 21st of December he left the hospital of his own accord. The pain at this time was very nearly, but not completely relieved: the knee was swollen only in a very slight degree, and the trifling swelling, which remained, appeared to arise not from fluid within the articulation, but from thickening of the soft parts in consequence of their having been previously inflamed.

CHAP. V.

ON A SCROPHULOUS DISEASE OF THE JOINTS
HAVING ITS ORIGIN IN THE CANCELLOUS
STRUCTURE OF THE BONES.

SECT. I.

Pathological Observations.

THE term scrophula is often employed without much precision ; and indeed it is not always easy to determine, what symptoms ought, and what ought not, to be referred to this disease. It has been usual to regard nearly all the affections of the joints as scrophulous ; and I believe it may be found that persons having a predisposition to scrophula are, on the whole, more liable than others, to those affections, which form the subject of the

preceding chapters. As however they occur very frequently, where no such predisposition exists, there seem to be no sufficient grounds for considering them as having any necessary connection with it: and it can be no more proper to designate these as scrophulous, than it would be to denominate inflammation of the synovial membrane a mercurial disease, because it occasionally arises from the use of mercury. But there is another malady, which affects the joints, having all the characters of scrophula: generally occurring in persons who have a scrophulous appearance, and usually preceded by, or continued with, other scrophulous symptoms.

In this disease of the joints, the cancellous structure of the bones is the part primarily affected; in consequence of which, ulceration takes place in the cartilages covering their articulating surfaces. The cartilages being ulcerated, the subsequent progress of the disease is in many respects the same, as where this ulceration takes place in the first instance.

CASE XLI.

Thomas Scales, aged 18, having a scrophulous appearance, was admitted into St. George's Hospital on the 18th of October, 1815.

He complained of pain, which he referred to the inside of one foot. The pain was constant, but slight, and not sufficient to prevent his walking as usual. There was very little, if any, tumefaction, and the parts were not tender to the touch. He was also in a general ill state of health: there were symptoms of derangement of the functions of the liver, and the urine was turbid and deposited a quantity of sediment, which stained the vessel that contained it of a pink colour. He was heavy and stupid, and scarcely able to give any consistent account of his ailments. There were some small ulcerations at the edges of his eyelids.

While he was under a course of remedies for these complaints, he was seized,

in the beginning of February, 1816, with a fever, of which he died on the first of March.

On dissection, the foot, which had been the seat of the pain, was particularly examined. The bones of the tarsus, and metatarsus, were found to contain an unusually small quantity of earthy matter, so that they were preternaturally soft, and admitted of being cut in any direction with a scalpel, without turning its edge. The cut surfaces of these bones were of a deep red colour, in consequence of increased vascularity; and vessels injected with their own blood could be distinctly traced extending from the bones into the cartilages covering them, and rendering the latter, in a few spots, of a red colour. The cartilage covering the internal cuneiform bone, where it forms the joint with the metatarsal bone of the great toe, was ulcerated to a small extent. The ulceration had begun on that side of the cartilage which was connected to the bone; the surface towards the joint remaining

entire. The bones of the tarsus were more diseased than those of the metatarsus; and those on the inside of the tarsus were affected in a greater degree than those on the outside. The bones of the other foot were affected in the same manner, but in a much less degree. Some of the other bones were examined, and were found nearly in a natural condition.

CASE XLII.

December 21st, 1814. In a boy apparently about ten years of age, whose body I had the opportunity of examining after death, I observed the following appearances.

Both elbows were slightly swollen. On the fore-part of the right arm, immediately above the elbow, there was the orifice of a sinus, which extended downwards obliquely into the cancellous structure of the bone, where it terminated, without communicating with the cavity

of the joint. The cancellous structure, of the articulating extremities of the os brachii, radius, and ulna, was so soft, that it might be crushed by a very slight degree of force when squeezed between the fingers : it was of a dark red colour ; preternaturally vascular, and there was a reddish fluid, mixed with medulla, in the cancelli. The cartilages covering the radius and ulna were in a natural state ; that belonging to the os brachii was ulcerated in a few spots on the surface towards the bone, while the surface towards the cavity of the joint was entire. There were no morbid appearances of the ligaments or synovial membrane.

The bones of the left elbow were in a similar state of disease ; the cartilages were entirely destroyed by ulceration ; and carious surfaces of bone were exposed. A small portion of dead bone had exfoliated into the cavity of the joint, where it lay, surrounded by matter. The synovial membrane and ligaments were extensively destroyed, and there

were several sinuses communicating with the joint and opening externally.

On examining the right knee, which externally had not the slightest marks of disease, and admitted of perfect motion, the cancellous structure of all the bones, which enter into its composition, was found in the same morbid condition with the bones of the elbows, being preternaturally red and vascular, with a much less proportion than is usual of earthy matter, so that they admitted of being crushed by a very slight force. In the interior of the lower extremity of the femur, between the two condyles, there was one part, where the earthy matter seemed to have entirely disappeared, and there was in consequence an irregular space, in which there was little else than medulla and reddish fluid mixed together; near this part, the cartilage had only a very slight adhesion to the bone, and ulceration had begun on its inner surface.

In several other joints, which were examined, there were marks of the same disease, but in a less advanced stage.

CASE XLIII.

John King, twenty-six years of age, having blue eyes, thick lips, and a florid complexion, was admitted into St. George's Hospital, on the 1st of June, 1811, on account of a complaint in his right ankle and foot. I received the following account of his case, partly from himself, and partly from a medical gentleman, who was in the habit of seeing him before he came into the hospital.

About the end of May, 1810, he wrenched his foot. The instep and ankle became swollen and painful, but in a few days these symptoms subsided. During the summer he experienced slight pain and weakness of these parts, whenever he took more than his usual quantity of exercise ; but in October a slight tume-

faction was observed on each side of the ankle, and the pain was more severe, but still not sufficient to prevent his going about his usual occupations. About the middle of December the pain became more violent, and he was confined to the house for a fortnight; after this the pain abated, so that he was able to go about with the assistance of a crutch.

In March, 1811, an abscess burst on the outside of the foot. The formation of the abscess was not attended with any considerable degree of pain.

He formerly had been supposed to labour under incipient *phthisis pulmonalis*; but from the time of the disease having begun in his foot, he suffered no inconvenience from the complaint in his lungs.

At the time of his admission into the hospital, there was a diffused œdematous swelling of the soft parts over the whole foot and ankle. On the outside there were the orifices of three or four sinuses,

which had burst at different periods. He had very little pain, even on motion or pressure. Soon after his admission, another abscess broke on the inside of the heel.

On the 11th of July, the leg was amputated.

On examining the foot, the cells of the cellular membrane were found distended with serum and coagulable lymph.

All the bones had undergone a morbid change, similar to what was observed in the last case, except that they were still softer and more vascular.

The cartilages of the ankle were completely destroyed by ulceration, and the exposed surfaces of bone were in a state of caries. The cartilages of the tarsus were entire, but, in some places, of a red colour, and this was found to arise from vessels loaded with red blood, extending into them from the bone. The ligaments and synovial membranes of the tarsal joints were in a natural state, as were also

those of the ankle, except where they had been destroyed by the abscesses.

CASE XLIV.

This patient was a soldier in the Coldstream Guards. I once had an opportunity of seeing him before amputation was performed, and, through the kindness of the medical officers of the regiment, I was favoured with the previous history of the complaint, and with the opportunity of examining the amputated joint.

William Miles, twenty years of age, of a delicate complexion, with red hair and dilated pupils, was attacked with a slight pain and swelling of the left knee, about the middle of January, 1808. On keeping quiet for a few days the swelling subsided ; but it returned about the end of March, though still attended with very little pain.

He was received into the hospital of the battalion at Chatham, and on the

9th of June following, he was sent to the regimental hospital in London.

At this time, the diseased knee measured in circumference three inches more than the other. Fluid was felt external to the joint, and in the cavity of the joint itself. The leg was kept extended, and all attempts to bend it gave considerable pain ; but otherwise, the pain, which he endured was trifling, amounting only to a slight degree of uneasiness, deep-seated in the joint. On the 8th of July, an abscess burst near the inner edge of the patella, and discharged about eight ounces of thin pus. On the 27th of July, the limb was amputated.

On examining the knee, the articulating extremities of the tibia and fibula were found so soft, that they were readily cut by a common knife : they contained much less earthy matter than is usual, and their cancelli were filled by a yellow cheesy substance.

The cartilage covering the head of the

tibia, was destroyed by ulceration in a few spots at the margin. That of the femur, was eroded for a very small extent behind the crucial ligaments. The patella, and the cartilage covering it, were in a natural state. Coagulable lymph, having a gelatinous appearance, had been effused into the cellular texture, on the outside of the synovial membrane. Pus was found external to the joint, and in the joint itself.

CASE XLV.

Charles Miller, twenty years of age, having blue eyes, light hair, and a fair complexion, was admitted into St. George's Hospital, in April, 1808, on account of a disease of one foot.

The whole foot was swollen and œdematous, with two fistulous sinuses, one on the inside and the other on the outside, through which a small quantity of scrophulous matter was discharged. A

probe having been introduced into either of these sinuses, some exposed pieces of bone might be distinguished.

On the 16th of May, the limb was amputated below the knee.

On examining the amputated foot, the muscles were found pale and wasted from want of use, and the cellular membrane was distended with coagulable lymph.

The extremities of the tibia and fibula, all the bones of the tarsus, and the extremities of the bones of the metatarsus, contained much less earthy matter than is usual. They were so soft, that they might be cut with a scalpel without the edge of it being turned. They were preternaturally red and vascular, and a yellow cheesy substance was deposited in the cancelli. The cartilage at the base of the fifth metatarsal bone was destroyed by ulceration. Those at the bases of the three middle metatarsal bones were also destroyed, and the exposed surfaces of bone were undergo-

ing the process of exfoliation. The cartilages of all the other bones were in a natural state. Pus and coagulable lymph had been effused in the neighbourhood of the dead and carious bones, and the sinuses communicated with them. The synovial membranes and ligaments were in a natural state, except where destroyed by the abscesses.

CASE XLVI.

James Miller, twenty-one years of age, was admitted into St. George's Hospital on the 21st of May, 1817, on account of inflammation of the iris of one eye, and some eruptions, which had followed a sore on the prepuce: and for these complaints he was put through a course of mercury.

About the end of July, soon after the mercurial course had terminated, he complained of a slight degree of pain of the left ankle. A swelling took place, and an abscess formed on the outside of the

ankle, which was opened on the 26th of September. Another abscess afterwards formed, and was opened on the inside. It was observed, that there was pain while the abscesses were coming forward, but little or no pain after they were opened. The abscesses continued open, and discharging matter, but the quantity of the matter gradually diminished.

About the beginning of October, he became affected with cough, and it soon became evident that he laboured under tubercles of the lungs.

In the beginning of December, he complained, for the first time, of pain of the left elbow ; and on examination, it was found that an abscess had already presented itself underneath the skin. This abscess burst in the beginning of January, 1818, and he scarcely complained of any pain in the elbow afterwards.

The disease in the lungs continued to make progress, he expectorated purulent matter, and died in March following.

On dissection, the lungs were found extensively tuberculated, and containing numerous abscesses. The bones composing the left ankle were preternaturally vascular and soft, so that they might be cut with a scalpel, and in some parts a small quantity of yellow cheesy substance was found in the cancelli. The abscess on the outside of the ankle seemed to have originated in the lower extremity of the fibula, and there was a cavity (large enough to receive the end of the little finger), in that bone, made by the process of ulceration, and forming the bottom of the abscess. Both abscesses however communicated with the joint itself. The cartilages of the ankle were nearly destroyed; and the tibia and astragalus were united, partly by coagulable lymph, and partly by bony ankylosis. The abscess in the outside of the left elbow, was found communicating with that joint by a large opening. The bones were in the same morbid condition as those of

the ankle ; the cartilages were entirely destroyed by ulceration.

The patient had never complained of the right elbow ; but after death, a small abscess was discovered on the inside, which however did not communicate with the cavity of the joint, but appeared to have originated in the substance of the bone, and to have made its way through the periosteum.

The cancellous structure of the articulating extremities of the bones, which composed the joints of the knees, wrists, and the right ankle, were preternaturally soft and vascular ; but there were no abscesses connected with them, and the cartilages were entire. The bones of the hip and shoulder were in a natural state.

There was an enlarged absorbent gland in the groin, converted into a cheesy substance.

The preceding cases sufficiently illustrate the nature and progress of this disease. The morbid affection appears to have its origin in the bones, which become preternaturally vascular, and containing a less than usual quantity of earthy matter ; while, at first, a transparent fluid, and afterwards a yellow cheesy substance is deposited in their cancelli.

From the diseased bone, vessels carrying red blood extend into the cartilage, which afterwards ulcerates in spots, the ulceration beginning on that surface, which is connected to the bone. The ulceration of the cartilage often proceeds very slowly. I have known a knee amputated on account of this disease, in which the cartilage was absorbed, for not more than the extent of a sixpence. Occasionally a portion of the carious bone dies and exfoliates.

As the caries of the bones advances pus is collected in the joint. At last the abscess bursts externally, having formed

numerous and circuitous sinuses. Inflammation takes place of the cellular membrane external to the joint. Serum, and afterwards coagulable lymph is effused, and hence arises a puffy and elastic swelling in the early, and an œdematous swelling in the advanced stage of the disease.

The scrophulous affection attacks only those bones, or portions of bones, which have a spongy texture, as the extremities of the cylindrical bones, and the bones of the carpus and tarsus: and hence the joints become affected from their contiguity to the parts, which are the original seat of the disease. I have never met with an instance of the alteration of structure, which has been just described, in the cranium, nor in the middle of the cylindrical bones. *

* It should be observed, that in some other cases, besides those of scrophulous affection, the bones are found to be more or less altered from their natural

SECT. II.

On the Symptoms of this Disease.

THE scrophulous affection of the joints occurs frequently in children: it is rare after thirty years of age. Examples of it occur in almost every joint of the body, but the hip and shoulder appear on the

texture. When a bone is extensively carious, it seems as if the absorption of the earthy part sometimes takes place more rapidly than that of the animal matter, and hence it becomes preternaturally soft in the neighbourhood of the carious surface, at the same time that it assumes a dark colour, and has a foetid smell, from the lodgment of putrid matter in the cancelli. Occasionally a bone loses some of its natural hardness, in consequence (as it would appear) of it having been for a long time inflamed. This happened in two cases, which came under my observation, where the cranium had been in a state of slow inflammation, induced in one case by the use of mercury, and in the other by a mechanical injury. But here the softened condition of the bones does not exist in the same degree, as in the scrophulous disease, which has been described above, nor is there the same red appearance of the cancellous structure, nor the same deposition of yellow cheesy substance.

whole to be less liable to it than any of the other articulations. *

As it depends on a certain morbid condition of the general system, it is not surprising that we should sometimes find it affecting several joints at the same time; nor, that it should shew itself in different joints in succession; attacking a second joint after it has been cured in the first, or after the first has been removed by amputation. It is seldom met with, except in persons who have the marks of what is called a scrophulous *diathesis*: and in many cases it is either preceded, attended, or followed, by some other scrophulous symptoms; such as

* Perhaps this arises from the circumstance of the hip and shoulder being less exposed to the influence of the external cold, which in most instances promotes the developement of scrophulous diseases. So we find, the scrophulous enlargement of the lymphatic glands, to occur more frequently in the neck than in the groin or axilla, which are generally defended by a warmer clothing.

enlargement of the scrophulous glands of the neck and mesentery ; or tubercles of the lungs. I have often been led to believe, that the occurrence of this disease in the joint, has suspended the progress of some other, and perhaps more serious disease elsewhere.

The scrophulous disease is more likely to be confounded with that, which formed the subject of the last chapter, than with any other. There is in many respects a correspondence in their symptoms. There are however certain points of difference, and I believe that this difference will be found sufficient to enable the practitioner, who is careful and minute in his observations, to make a correct diagnosis ; at least in those cases, in which the local disease is not so far advanced, and in which it has not so much affected the general constitution, as to make the diagnosis of no importance.

While the disease is going on in the cancellous structure of the bones, before

it has extended to the other textures, and while there is still no evident swelling, the patient experiences some degree of pain, which however is never so severe as to occasion serious distress, and often is so slight, and takes place so gradually that it is scarcely noticed.

After a time (which may vary from a few weeks to several months) the parts external to the joint begin to sympathise with those within it; and serum and coagulable lymph being effused into the cellular membrane, the joint appears swollen. The swelling is puffy and elastic, and though usually more in degree than it is, at the same period, in those cases, in which the ulceration of the cartilages occurs as a primary disease, it is not greater in appearance, because the muscles of the limb are not equally wasted from want of exercise. I have observed that in children, the swelling is in the first instance usually less diffused, and somewhat firmer to the touch than in the adult.

If a suspicion of some disease of the joint has not existed previously, it is always awakened as soon as the swelling has taken place. Should the patient be a child, it not uncommonly happens that the swelling is the first thing, which the nurse or the parents discover. This leads to a more accurate enquiry, and the child is observed to limp in walking, if the disease be in the lower limb, and to complain of pain on certain occasions.

I have said, that the swelling is puffy and elastic, and after what has been remarked in the former chapters, it is needless to point out more particularly the difference between it, and the swelling which takes place in cases of inflamed synovial membrane. The swelling increases, but not uniformly, and it is greater after the limb has been much exercised, than it is, when it has been allowed to remain for some time in a state of quietude.

As the cartilages continue to ulcerate,

the pain becomes somewhat, but not materially aggravated. It is not severe, until abscess has formed and the parts over the abscess have become distended and inflamed. The skin under these circumstances assumes a dark red or purple colour. The abscess is slow in its progress ; when it bursts or is opened, it discharges a thin pus, with portions of curdly substance floating in it. Afterwards the discharge becomes smaller in quantity, and thicker in consistence, and at last it nearly resembles the cheesy matter, which is found in scrophulous absorbent glands.

In most instances several abscesses take place in succession, but at various intervals ; some of which heal, while others remain open in the form of fistulous sinuses, at the bottom of which carious bone may be distinguished by means of a probe.

The disease not unfrequently remains in this state for several months, or even

for a much longer period, without the constitution being materially disturbed. In the less fortunate cases, the patient at last becomes affected with a hectic fever, under which he gradually sinks, unless the cause of it be removed by amputation. At other times, a curative process begins; the sinuses close; the oedema subsides; and the patient ultimately recovers, either with or without an ankylosis; accordingly as more or less destruction of the articulating surfaces has taken place. But the cure is always tedious, unless the disease has been arrested at a very early period. It is not uncommon to see a patient with a scrophulous joint, in a state of imperfect ankylosis, with a single sinus remaining open, and waiting for many years, before even such a cure as ankylosis affords, can be said to be completed. The chance of ultimate recovery is not the same in every articulation; and I have observed, that it is much less, where the disease attacks the complicated

joints of the foot and hand, than when it is situated in those, which, though of a larger size, are of a more simple structure.

The principal difference which is to be observed, between the symptoms, which have been just described, and those, which are met with, where ulceration of the cartilages occurs as a primary affection, is in the degree of pain, which the patient endures, and which is much less in the cases of the former than in those of the latter description.

It may indeed be a matter of surprise, that in cases of this scrophulous affection, the sufferings of the patient should be so little as they are found to be, in proportion to the quantity of local mischief. For the most part, the pain, which he experiences, is not a subject of serious complaint, except at the time when an abscess is just presenting itself underneath the skin, and then it is immediately relieved by the abscess bursting. There is

never that severe pain, which exhausts the powers and the spirits of the patient, in cases of ulceration of the cartilage, except in a very few instances, and in the most advanced stage of the disease, when a portion of the ulcerated bone has died, and having exfoliated so as to lie loose in the cavity of the joint, irritates the parts, with which it is in contact, and thus becomes a source of constant torment.

There are other circumstances, besides the less degree of pain, which although not in themselves sufficient, it is useful to take into the account in forming our diagnosis: such as the general aspect and constitution of the patient, and his having manifested a disposition to other scrophulous symptoms; the very tedious progress of the disease; and the circumstance of the suppuration not being in general confined to a single collection of matter; but producing a succession of abscesses.

Perhaps it is on the whole more difficult to distinguish this disease in the hip,

than in any other joint; since the appearance of the nates as well as the position, and the alteration in the length of the limb, give it in great measure the same character with the disease, which formed the subject of the last chapter. Yet even here, attention to the circumstances which have been enumerated, will usually enable us to distinguish the real nature of the case. A girl laboured under an affection of the hip-joint, in which the nates were flattened, the limb had become shortened, and an abscess had broken on the outside of the thigh; but it was observed that she had suffered comparatively little distress, and that she had complained of very much less pain, than is usual with the same combination of symptoms. Under these circumstances she died, and when I was about to examine the body, I observed to those, who were present, that there was little doubt, but that the origin of the disease would be found to have been, not in the cartilaginous surfaces,

but in the cancellous structure of the bone. The appearances which were observed verified this remark. The cartilages were ulcerated, and the bones themselves destroyed to some extent. The latter were soft, so that they might be cut with a scalpel, without turning its edge; and on dividing the articulating extremity of the femur longitudinally, a considerable collection of thick pus was found in the neck of that bone, below the head, which either had not escaped at all, or had escaped in very small quantity, by oozing through the cancelli, which were interposed between it, and the cavity of the hip-joint.

SECT. III.

On the Treatment.

IN attempting the cure of the scrophulous disease of the joints, it is neces-

sary to bear in mind, that it depends on a certain morbid condition of the general system. It seems reasonable to expect, that when the local affection has once begun to exist, local remedies may be of service in checking its progress ; but that with a view to the ultimate result, such remedies as operate on the constitution of the patient, may be of as much, if not of more importance, than any local treatment.

I cannot say, that the abstraction of blood from the neighbourhood of the diseased joint is never useful, but it certainly is not necessary in ordinary cases. The state of the cancellous structure of the bones approaches to that of inflammation, and the cartilages have the appearance of being inflamed, before they begin to ulcerate ; but the inflammation is of a specific kind, and like scrophulous inflammation in other parts, is not likely to be relieved by the loss of blood, in

the same degree as common inflammation. I have seldom known any benefit to be derived from the use of blisters or stimulating liniments: nor in the cases, in which I have tried them, have I observed caustic issues to be productive of those good effects, which are so distinct in another variety of disease.

Cold evaporating lotions seem to check, in some degree, the extension of the disease from the bones to the other textures, and to retard the occurrence of suppuration, and they may be employed with advantage, in the early stage of the complaint.

But neither at this, nor at any other period, is any thing of so much importance, as that the joint should be kept in a state of quietude. All motion, and pressure of the articulating surfaces against each other is likely to promote the ulceration of the cartilages, and hasten the formation of abscess. We cannot suppose that rest will contribute to the

amendment of the scrophulous state of the bones themselves; but it may do much towards preventing the disease from affecting the other parts. I do not mean to assert, that in every case, the patient should be kept in a state of absolute rest for a long period, but certainly all motion and exercise of the limb should be avoided, as much as possible, consistently with due attention to the state of the patient's health, and the improvement of his constitution. If the disease be in the lower extremity, he should never rest the weight of the body on the foot belonging to it; he should never walk, except with the assistance of a crutch; and he should, if possible, be exposed to the fresh air, by means of some kind of open carriage, rather than in any other way. If it be in the upper extremity, the hand and fore-arm should be supported by means of a sling. In many cases, it will be useful to keep the diseased joint steady by means of a light paste-board splint and a bandage.

During the formation of abscesses, fomentations and poultices may be employed, with a view to hasten their progress, and relieve pain ; and they may be continued for some time after the abscess has burst ; or simple dressings may be applied according to circumstances.

When, after several abscesses have taken place, the disposition to suppuration appears at length to have ceased, and the swollen joint has become diminished in size, it may be expected that a curative process by means of ankylosis, is about to commence. At this period, pressure by means of stripes of linen, spread with soap cerate, or some other moderately adhesive plaister, and applied in a circular manner round the limb, will be productive of benefit. This will promote the healing of the sinuses, and by more completely preventing the motion of the joint, will lessen the chance of fresh suppuration, and favour the union of the ulcerated bony surfaces.

If a portion of the bone has lost its living principle, and has exfoliated into the cavity of the joint, the chance of ultimate recovery is very much diminished. For the most part, the dead bone is so entangled in the living parts, that it is incapable of separation by a natural process, and every attempt to remove it by artificial means will occasion a fresh attack of inflammation and abscess. It is to be observed, however, that bone, which is found exposed at the bottom of a sinus, is not necessarily doomed to exfoliate. It may be simply ulcerated, and may possibly granulate, and recover; and the surgeon, therefore, is not warranted in giving a prognosis, which is decidedly unfavourable, merely because he discovers a piece of exposed bone, when he makes an examination with a probe.

With respect to the constitutional treatment; — it is to be supposed, that the air of a crowded city must be more or less unfavourable; and that a residence on

the sea-coast is likely to be more beneficial than a residence in the country elsewhere. The patient should live on a nourishing but plain diet ; he should be in the open air in summer, as much as he can be, without exercising the joint. His mode of life should, in all respects, be regular and uniform.

It is more difficult to appreciate the value of medicines in a disease, which is so completely chronic, than in acute diseases ; but of those, which I have tried, it has appeared to me, that preparations of iron are much more useful than any others. They must, however, be continued for a considerable length of time, and in order that this may be effected, it is generally necessary that different preparations should be given in succession, a change being made, whenever the patient begins to loathe that, which he is already taking. Of course the steel medicine should be suspended if it excites any febrile action in the system, or if a

febrile action be excited in consequence of the formation of abscess. Under these circumstances the mineral acids may be substituted for it with advantage. In children, it will be generally found useful to combine the plan of treatment, which has been just described, with the occasional exhibition of mercurial purgatives.

When the organization of the joint is completely destroyed, and the constitution has become affected, so that the patient's health is evidently failing, there can be no doubt of the necessity of the local disease being removed by amputation. But a question concerning the expediency of this operation will often arise under other circumstances. The patient has hitherto not suffered with respect to his general health, or has suffered in a very slight degree; the condition of the diseased joint is such that ultimate recovery is very doubtful; and it is certain that no better cure is to be expected,

than that by means of ankylosis ; and even this cannot be looked for except after the lapse of a considerable length of time. Is the chance of the ultimate preservation of an imperfect limb sufficient to repay the patient for all the trouble, and pain, and anxiety, which he must go through, in order to attain this object ? Perhaps it is not : particularly with persons belonging to the lower orders of society, who have to support themselves by their bodily labour. There are however some other points to be taken into consideration, before this question can be properly decided. A girl was admitted into St. George's Hospital, who laboured under this disease in the bones and joints of the tarsus. Her foot was amputated by Mr. Griffiths. In about three weeks the stump was perfectly healed ; but now she was seized with symptoms, which indicated an affection of the mesenteric glands, which had not shewn itself previously, and she

died. On dissection, numerous glands of the mesentery were found enlarged, and containing a cheesy matter. Another girl, whose arm I amputated on account of a scrophulous disease of the elbow, became affected in the same manner, immediately after the stump was healed. She also died, and similar appearances presented themselves on dissection. A man, whose leg was amputated on account of a scrophulous disease of the tarsus, in a short time after the operation, began to experience symptoms, which indicated the incipient state of some pulmonary complaint: and soon afterwards the other foot became affected in the same manner as the first. These are a few of many cases, which might be adduced, as leading to this conclusion, that the occurrence of this scrophulous disease in a particular joint may be the means of preventing the scrophulous disposition from shewing itself in some other organ, and that if the affected joint be

removed by an operation there is more danger of disease breaking out elsewhere, than if the operation had not been resorted to. I do not say that these considerations are sufficient to warrant the surgeon in forbidding an operation altogether, in all cases, where it is not actually and indisputably necessary to save the patient's life; but they are certainly sufficient to make him cautious not to recommend and urge it too strongly. They shew the prudence of delay in certain cases. Perhaps after the lapse of one, or two, or more years, by means of proper medicines, and a judicious attention to diet, and mode of life, and still more in consequence of that change, which the mere lapse of time may produce in the constitution of a young person, the patient's general health may be so far improved, that the diseased joint may be removed, without that risk of subsequent mischief, which would have been incurred at a former period.

SECT. IV.

Cases of this Disease.

SEVERAL of the cases related in the first section, will serve to explain the principal circumstances of this scrophulous affection of the joints, in its most aggravated form.

The following exhibit it in its less advanced stages, where it is still capable of a cure. It may be presumed that in these cases, the original disease was that morbid condition of the cancellous structure of the bones, which has been just described, since the symptoms exactly corresponded to those, which have occurred in other cases, which have been proved by dissection to be of this nature.

CASE XLVII.

William Moulds, six years of age, having a scrophulous aspect, was admitted

into St. George's Hospital, on the 23d of February, 1814.

His left knee was an inch and a half in circumference larger than the other. The swelling was puffy and elastic; without fluctuation, having nearly the form of the articulating extremities of the bones; but filling up the space on each side of the ligament of the patella. The joint admitted of considerable motion, but not of complete flexion and extension. He complained of pain, which was worst at night: but never very severe. It was somewhat aggravated by pressure.

His parents attributed the complaint to some trifling hurt, which he had met with a year ago; soon after which, a slight degree of pain, and tumefaction, was first observed, which had continued ever since, and had encreased, particularly within the last month.

On his admission, with a view to the relief of the external inflammation, blood was taken from the knee by means of

leeches and cupping. A cold lotion was applied; and he was directed to take ʒj of the vinum ferri, with a few drops of the tinctura ferri muriatis three times in the day. On the 3d of March, the knee was bound up in stripes of linen spread with soap cerate, chiefly with a view to restrain the motion of the diseased joint, without interfering with the patient's bodily exercise.

March 20. The swelling was somewhat diminished; and he did not complain of pain.

April 1. He was in all respects better. As the former preparations of iron had begun to disagree with him, they were changed for ten grains of the carbonate of iron, three times in the day.

April 20. Scarcely any swelling of the joint remained: and there was no pain or stiffness. He quitted the hospital.

CASE XLVIII.

A. B., a handsome boy, having blue eyes, and light hair, in the year 1806 had a scrophulous enlargement of some of the glands of his neck, which suppurated and burst.

In the month of June, 1810, being then eight years of age, he was observed to limp in walking; but he did not complain of pain, and little notice was taken of this circumstance.

In the beginning of December, 1810, some degree of tumefaction was observed of the left instep and ankle. About the end of this month he received a trifling hurt of these parts; and now the pain of the ankle, which before had been so slight, that he scarcely spoke of it, became more considerable, and he was unable to walk. A gentleman who was consulted directed the application of blisters, but they were productive of no relief.

In the middle of January, 1811, when

I was first consulted, there was a puffy elastic swelling on each side of the ankle and instep ; there was scarcely any pain, when the joint was perfectly quiet ; but on attempting to use it, the pain was more considerable, and it was particularly aggravated, when the heel was pressed upwards against the bones of the leg. In other respects he was in perfect health.

I directed him to take the sulphate of iron internally, and to avoid all exercise of the joint, walking only on crutches, and so as never to place this foot in contact with the ground. Stripes of linen spread with soap cerate, were applied for the purpose of more effectually restraining motion.

I did not see him again until the beginning of March, when the pain and swelling were found to be somewhat diminished. As the stripes of soap cerate did not seem sufficiently to answer the intended purpose, a light pasteboard splint was applied on each side of the leg

and foot, and secured by means of a bandage.

April 12th. The puffy swelling was evidently diminished, and there was no pain, even when the heel was pressed upwards against the tibia. The same treatment was continued.

May 26th. The swelling was further diminished ; and, on the 29th of June, the affected foot and ankle scarcely differed in appearance from the other. He was free from pain even on motion. The splints were left off, but it was directed that he should continue to wear the bandage. He was allowed occasionally to put his foot on the ground.

July 20th. He continued well. He went to the sea-side, with directions to continue the steel medicine, and to bathe in the sea twice in the week.

CASE XLIX.

George Lavel, nine years of age, and having a scrophulous appearance, in

January, 1817, complained of an aching in his left elbow, and in about two or three months it was observed that the elbow was swollen. In May, 1817, he became an out-patient of St. George's Hospital. At this time, the elbow was swollen, and painful, but the pain arose chiefly from an abscess which presented itself underneath the skin on the inside. After the abscess had burst, it was observed that the swelling, which was independent of it, was not considerable, and that it seemed to arise entirely from an effusion of serum and coagulable lymph into the cellular membrane external to the joint. From this time he suffered very little pain, until the beginning of January, 1818, when another abscess began to shew itself on the outside of the elbow. On the 28th of January he was admitted as an in-patient of the hospital. The joint now admitted of very limited motion. Whenever it was moved, or when the articulating surfaces were pressed against each other, he com-

plained of some but not of severe pain. He kept the fore-arm in the half-bent position, and walked about, supporting the hand in a sling, with very little inconvenience.

In the beginning of February, he was directed to take six grains of carbonate of iron three times in the day; and a purge of calomel and rhubarb was administered occasionally. The abscess was opened, and a poultice was applied.

March 1st. The joint was smaller, but he was feverish, and suffered pain at night.

March 21st. The swelling was much diminished, the pain had abated; he slept well at night, and was free from fever.

In the middle of May there was a recurrence of pain in the joint, and another abscess presented itself on the outside, which was opened on the 19th of May. After this a fourth abscess formed on the fore-part of the elbow, and broke on the 23d of June.

July 4th. There was little or no swelling. He was free from pain; the abscesses continued open, discharging a very small quantity of matter.

The poultices and fomentations, which had been hitherto employed during the formation of the abscesses, were now left off; and some simple dressings, and a bandage, were applied in their stead. The swelling continued to subside; he had no return of pain or abscess. On the 4th of September, the joint was not larger than the other; it admitted of much more motion than formerly; there was no pain; there was still one sinus, which was not completely closed, and which discharged a minute and almost imperceptible quantity of matter; all the other abscesses were completely healed.

CHAP. VI.

ON CARIES OF THE SPINE.

SECT. I.

Pathological Observations.

IT is obvious from the structure of the vertebral joints, that they can be liable to no diseases bearing any resemblance to the affections of the synovial membrane, which occur in other articulations. But analogy would lead us to expect, what experience demonstrates, that those diseases, which commence in the harder textures may occur here as elsewhere, and that an extensive caries of the spine may have its origin, sometimes in an ulceration of the intervertebral cartilages, and at other times in a morbid condition of the cancellous structure of the bodies of the vertebræ.

In one of the cases, which have been related in a former chapter, where ulceration of the articular cartilages had begun in several other parts, those between the bodies of some of the dorsal vertebræ were found to have been very much altered from their natural structure. I had an opportunity of noticing a similar morbid condition of two of the intervertebral cartilages in a patient, who, some time after having received a blow on the loins, was affected with such symptoms, as induced Mr. Keate to consider his case, as one of incipient caries of the spine, and to treat it accordingly with caustic issues ; and who, under these circumstances, died of another complaint. In various other instances, in which the patients had died in the advanced stage of caries of the spine, and in which the appearances were examined after death, I observed that the destruction of the intervertebral cartilages was much greater than that of the bones themselves, the lat-

ter having retained their ordinary structure and hardness, and the caries of them being either entirely confined to, or most extensive on, those surfaces, to which the cartilage had been connected.

The above circumstances seem to render it probable that this affection of the spine frequently originates in the intervertebral cartilages. The following cases afford a more direct evidence in favour of this opinion.

CASE L.

Christiana Clear, a girl eight years of age, was admitted into the Infirmary of the parish of St. George, Hanover-square, in the year 1808, on account of a disease of the spine. At this time, the upper part of the spine was bent forward, and the spinous processes of some of the dorsal vertebræ formed a preternatural projection at the posterior part; but still she was able to walk without assistance.

Soon after her admission, an abscess presented itself, and burst in the groin; and this was followed by a second abscess, which burst near the former.

The child was now under the necessity of being confined entirely to her bed. The abscesses continued to discharge pus. She became affected with hectic fever; nevertheless more than two years elapsed from the time of her having been first admitted into the infirmary, before she died.

The body was examined by Mr. Howship, to whom I am indebted for this account of the case. It was universally anasarcaous. The abdominal muscles were so wasted that scarcely any vestige of them was perceptible. This probably arose from the circumstance of the child having remained in bed for so long a time previous to her death, and having scarcely ever varied her position.

At the posterior part of the abdomen, there was a confused mass of soft substance, which proved to be the parietes

of an abscess communicating with the orifices in the groin.

The bodies of the lowest dorsal, and three superior lumbar vertebræ were found at the posterior part of the abscess, nearly consumed by caries. There were no remains of the intervertebral cartilages between the tenth and eleventh dorsal, nor between the third and fourth lumbar, vertebræ. These intervertebral spaces were filled with pus, and the opposite surfaces of the vertebræ were carious, but only to a small extent. The central part of the intervertebral cartilage between the ninth and tenth dorsal vertebræ had been completely absorbed, and pus was found in its place. Externally to this, the concentric layers of elastic cartilage were entire, though somewhat altered from their natural appearance.

CASE LI.

Mr. M., a young man, in the summer of 1816, became affected with pain

in his back, and general debility, which he attributed to his having lain on damp ground, while in the island of Ascension, in the preceding March. In the beginning of September he sailed for England, being compelled to return home, on account of the state of his health.

In February, 1817, he arrived in London ; complaining of pain in the back, and numbness of the thighs. Soon afterwards, on examining the spine it was observed that that part of it, which is formed by the dorsal vertebræ, was incurvated forward, and that in addition to this there was an evident lateral incurvation also. After this, an abscess burst in one groin, and continued open, discharging a large quantity of matter. The lower extremities became imperfectly paralysed ; he lay constantly on one side, with the thighs drawn forwards, so that his knees nearly touched his chin, and never varied from this position. He lingered until the 10th of August, 1818, when he died.

On inspecting the body, I found an abscess, which occupied nearly the whole of the anterior surface of the spine, from the upper part of the posterior mediastinum as low as the pelvis, and which communicated with each groin, extending downwards in the direction of the psoæ muscles. In many parts, in consequence of the contact of the matter of the abscess, the bodies of the vertebræ, and even the heads of the ribs, were affected with a superficial caries.

There were no remains of the intervertebral cartilage between the fourth and fifth dorsal vertebræ, and the opposite surfaces of these two vertebræ were consumed by caries to some extent, and hence arose the curvature of the spine forward; and they were consumed to a greater extent towards the left side, than towards the right, and hence arose the lateral curvature.

The intervertebral cartilage between the eleventh and twelfth dorsal vertebræ had

also entirely disappeared, and the opposite surfaces of these bones were in a state of caries ; but this had not extended itself sufficiently to occasion any sensible loss of bony substance.

The intervertebral cartilages between the third and fourth, fifth and sixth, seventh and eighth, tenth and eleventh dorsal vertebræ ; and also that between the twelfth dorsal and first lumbar vertebræ, were all found in a perfectly natural state towards the circumference ; but in the centre, they were of a dark colour ; and on the surfaces towards the bones they, as well as the bones themselves, were in a state of incipient ulceration, but without any appearance of pus having been secreted.

All the other intervertebral cartilages were, throughout their whole substance, in a natural condition : and the bones of the vertebræ every where had their natural texture and hardness. On laying open the theca vertebralis, the membranes

of the spinal marrow were found adhering together, behind the space between the fourth and fifth dorsal vertebræ.

The above cases, and the circumstances before mentioned, seem to warrant the conclusion, that, in many instances, caries of the spine has its origin in an ulceration of the intervertebral cartilages beginning in their centre, and extending to their circumference, and afterwards affecting the bodies of the contiguous vertebræ.

But there is no doubt, that there are other cases, in which caries of the spine has its origin in the bones themselves. The bodies of the vertebræ are liable to that peculiar disease of the cancellous structure, which occurs in the articulating extremities of other bones, and there is no reason, why it should not produce the

same results here, as elsewhere. The following cases, the first of which occurred in St. George's Hospital, and for the second of which I am indebted to my friend Mr. Henry Earle, of St. Bartholomew's Hospital, afford examples of this disease, and of the extensive mischief to which it may give rise.

CASE LII.

Edward Griffiths, forty-five years of age, was admitted into St. George's Hospital on the 15th of April, 1818, on account of an abscess, which presented itself in the left groin. He said, that about four months before his admission, he had been seized with pain in the loins, and that the tumor in the groin had shewn itself about six weeks after the commencement of the pain.

He was directed to remain constantly in the horizontal position ; and in a short time the tumor formed by the abscess

in the groin disappeared, and another shewed itself over the left os innominatum. On the 15th of May, this abscess was opened, and about forty ounces of pus were discharged. After this, he gradually sunk; and died worn out by a profuse suppuration on the 19th of August following.

On dissection, it was found that the cancellous structure of all the dorsal and lumbar vertebræ was of a dark red colour, and softer than natural, so that they might be cut with a common scalpel, or even crushed by the pressure of the thumb and fingers.

The opposite surfaces of the bodies of the second and third lumbar vertebræ, and of the cartilage between them, at the posterior part, were extensively destroyed by ulceration. Anteriorly, the bones and the intervertebral cartilage were entire, and the latter was in a perfectly natural state, but the bones throughout were of a dark and almost black colour.

On one side of the body of the twelfth dorsal vertebra, there was a small ulcerated spot, forming an opening which extended itself into a small cavity in the centre of the bone. This bone was also of a black colour; but the intervertebral cartilages belonging to it, as well as the intervertebral cartilages connected with the other vertebræ, were in a perfectly natural state.

The abscess had originated in the carious surfaces of the second and third lumbar vertebræ, and had extended itself behind the left psoas muscle, as low as the upper and anterior part of the left thigh, where it made a turn backwards on the inside of the tendon, and thus made its way to the place where it was opened on the posterior part.

The ribs were throughout unusually vascular, and brittle, so that they might be broken by the slightest force. There were vomicæ in the lungs, and tubercles in the liver.

CASE LIII.

Henry Shaw, seventeen years of age, consulted Mr. Earle in November, 1816, on account of a complaint, which had begun about three months before, and of which the following were the most remarkable symptoms.

He had frequent attacks of pain in the head, attended with giddiness. Occasionally he had fits, in which he was for a short time insensible, with a spasmodic action of some of the muscles of the neck. The right eye was amaurotic, and there was constant tinnitus aurium. His mental faculties were for the most part unimpaired.

By Mr. Earle's directions, he was cupped; purgatives were administered, and he was kept under the influence of mercury during six weeks, at the end of which time his symptoms had nearly disappeared.

About the end of May, 1817, he went

on a visit into the country, and while there he one day tripped and fell in crossing the room. Another set of symptoms now shewed themselves, for which he was brought to London. At this time he had pain in the back and in the right side, shooting in the direction of the costal nerves. He was subject to severe cramps in the stomach ; his bowels were irregular ; and he breathed with difficulty. He had cramps in his lower limbs, and his locomotive powers were impaired, though there was no actual paralysis of the muscles. His general health was much deranged. On examining the spine, Mr. Earle discovered a curvature, of which the convexity was turned backwards, occupying about the three middle dorsal vertebræ, and this was attended with a considerable alteration in the form of the chest. He was now removed into St. Bartholomew's Hospital, where Mr. Earle directed him to remain constantly in the horizontal

position, and an issue was made with caustic on each side of the spine. In a short time he lost the cramps of his lower extremities, but his general health continued to fail, and the difficulty of breathing increased.

In the middle of December he quitted the hospital. The exertion of being moved seemed to aggravate the disease. He was seized with numbness of the left leg and thigh; the dyspnœa became worse; and he sunk and died in convulsions on the 23d of December, 1817.

On dissection, the arachnoid membrane was found opaque and thickened. A large tumor, of almost cartilaginous hardness, occupied the anterior lobe, and a similar one the posterior lobe, of the right hemisphere of the cerebrum; and a third tumor occupied the greater part of the right lobe of the cerebellum. The ventricles were distended with water.

The right lung was studded with tubercles, and adhered universally to the pleura

costalis. A large abscess occupied the posterior mediastinum, at the bottom of which, the bodies of two of the vertebræ, together with the intervertebral cartilage between them, were found nearly destroyed by ulceration. The other intervertebral cartilages were in a natural state, but the bodies of the vertebræ were soft, and many of them were beginning to ulcerate. The ribs were porous, and their cancelli were filled with a curdly matter; and they were soft, so that they might be easily divided with a common scalpel. Four of the ribs were separated from their attachment to the spine, and were ulcerated as far as their tubercles.

There is no reason to doubt, that in these cases, the bones were the parts primarily affected. Other cases occasionally are met with, which at first appear to be of a similar, but which are, in reality, of a different nature. Where an

abscess has formed in the neighbouring soft parts; or, where there has been a large aneurysm of the descending aorta; and where a tumor produced by one or other of these causes, or in any other way, has long pressed on the bodies of the vertebræ, the bones become ulcerated, but not the cartilages between them, and the former are ultimately in a greater or less degree consumed, while the latter remain projecting almost of their natural size. In such cases, where the spine is carious, in consequence of disease beginning external to it, the symptoms are not the same as where it has begun in the spine itself. For the most part, the affection of the spine is not suspected during the patient's lifetime. After death, the bones are found of their natural texture and hardness; and it is easy to trace the origin of the disease in the neighbouring soft parts.

SECT. II.

On the Symptoms of Caries of the Spine.

As these two diseases of the spine correspond in this respect, that they terminate in a more or less extensive caries, it may be expected that there must be a certain degree of resemblance in the symptoms which they produce. This resemblance is indeed greater than where the same morbid affections take place in other joints. I suspect, that that disease, which has its origin in the cancellous structure of the bones, is more immediately followed by suppuration, than that, which commences in the form of ulceration of the intervertebral cartilages; and that the former seldom occasions a destruction of the vertebræ to so great an extent as the latter. But farther than this, nothing, which I have hitherto observed enables me to point out any circumstances, in which the symptoms of

these different diseases differ ; nor do I believe (however desirable it may be to do so), that it is possible, in the present state of our knowledge, to distinguish them from each other, with any degree of accuracy, in the living person. Perhaps future observations may throw light on this important subject. In the mean time, when I speak of the symptoms of caries of the spine, it is to be understood, that the observations, which I make, are (as far as I know) applicable to either one or other of those diseases, in which the caries originates.

It is evident, that two orders of symptoms may be the result of caries of the spine :—1st, Those, which are the immediate consequence of the morbid condition of the vertebræ themselves, and of the intervertebral cartilages. 2dly, Those, which arise from pressure on the spinal marrow, or from irritation propagated in some way, or another, to this important part of the nervous system. I believe, it

will be found, that, when the disease is situated above the lumbar region, it almost constantly happens, that these two sets of symptoms are combined, whereas when the vertebræ of the loins are alone affected, the latter set of symptoms are generally wanting. Perhaps, this may be accounted for, partly from the greater magnitude of the bodies of the lumbar vertebræ, in consequence of which, a much more extensive caries is necessary to produce the same quantity of incurvation here, than elsewhere ; and partly, from the circumstance of the spinal marrow here terminating in the bundle of nerves belonging to the lower extremities ; which possess a different structure, exercise different functions, and are probably of a less susceptible nature than the spinal marrow itself.

Caries of the lumbar vertebræ usually occasions a pain in the loins, which, after a longer or shorter period of time, is followed by an external abscess, shewing

itself in the groin, or in some other situation, and it constitutes one of the diseases, which are confounded with each other, under the name of Psoas or Lumbar abscess.

The symptoms, which are produced in those other cases, where caries is followed by curvature of the spine, and affection of the spinal marrow; have been described at length in the works of former writers, (more especially in the able and eloquent dissertations of Mr. Pott,) and it is unnecessary for me to repeat what has been already given to the world by others. I shall therefore only advert to certain points in the history of the disease, which some of my own observations may tend to illustrate.

The curvature of the spine, which this disease produces, cannot take place until the caries has made considerable progress; and hence, although it furnishes an excellent diagnostic mark of the disease in its most advanced stage, it affords the

surgeon no assistance whatever at that early period, when the diagnosis is of the most importance. Previous to the appearance of the curvature, the symptoms are not unfrequently very equivocal ; so that the real nature may often be overlooked by a careless practitioner ; and sometimes even by the most accurate and minute observer. A pain, and some degree of tenderness in that part of the spine, where the disease has begun ; a sense of constriction of the chest ; an uneasy feeling at the pit of the stomach, and of the whole abdomen ; a disturbed state of the functions of the alimentary canal, and of the urinary bladder ; a sense of weakness and aching, and occasional cramps of the muscles of the extremities ; one or more of these symptoms, according to the part of the spine, which is affected, and other circumstances, are in most instances met with before the form of the back has undergone any alteration. But it is obvious, that symptoms very

similar to these may arise from other causes ; and hence practitioners are liable to be led into error. Many cases also occur, in which these symptoms have been so slight, that, although the patient has recollected them afterwards, he did not experience sufficient inconvenience at the time to be induced to notice them, and I have even known some instances, in which they were altogether wanting, so that there has been no suspicion of any complaint existing previous to the actual discovery of the curvature.

In the greater number of cases, which have come under my observation, the curvature of the spine has been first noticed about six months after the commencement of the other symptoms. In one case only the interval was as long as two years.

In general, the curvature is at first only just perceptible ; and by degrees it becomes more distinct. In one instance, the patient, who had made no previous

complaint, immediately after some slight exertion, experienced a sudden pain, as if something had given way in the back, and immediately afterwards lost the use of her lower limbs, and observed that the spinous process of one of the lower dorsal vertebræ made an angular projection. In another patient a similar circumstance occasioned the same sensation, and was followed by numbness of the legs and thighs, and paralysis of the bladder ; but not by any evident curvature. Of course, we must suppose, that the disease had been making progress, before the occurrence of the trifling accident, which first induced its symptoms.

The distortion of the spine in these cases is usually of a peculiar kind, and such as nothing can produce except the destruction of the bodies of one or more vertebræ. The spine is bent forward, so as to form an angle posteriorly ; and although the destruction of the vertebræ may be the same, it is more obvious in

some parts of the spine, than it is in others. For example, the spinous processes in the middle of the back being long, and projecting downwards, the elevation of one of these must occasion a greater prominence, than that of one of the spinous processes of the neck, which are short, and stand directly backwards.

Curvature of the spine in the direction forwards, may arise from other causes, as a weak condition of the muscles, or a rickety affection of the bones. In general, in such cases, the curvature occupies the whole spine, which assumes the form of the segment of a circle. At other times, however, it occupies only a portion of the spine, usually that, which is formed by the superior lumbar, and inferior dorsal vertebræ; as I have ascertained, not only by examinations during life, but by dissection after death. Here the curvature is always gradual; never angular; and thus it may be distin-

guished from the curvature arising from caries. Nevertheless, I am satisfied, that, those different kinds of curvature, arising from different causes, have frequently been confounded with each other; and that some of the cases, which have been published as examples of caries of the spine, and in which, it may at first be a matter of surprize, that so complete and so speedy a cure has been effected, have in reality been cases of an entirely different malady.*

I believe it is generally supposed, that the lateral distortion of the spine arises from causes, which are independent of caries. This rule however must not be admitted without some exceptions. A slight degree of lateral curvature is, in some instances, the consequence of caries.

* Some excellent observations on this subject are published by Mr. Earle in the *Edinburgh Medical Journal* for January, 1815.

This was observed in one of the cases related in the last section, and the examination of the morbid appearances explained in what manner the lateral curvature was produced; that is, by the bodies of the vertebræ having been destroyed on one side, to a greater extent than on the other.

Mr. Copeland* has observed that the symptoms, which take place in this disease in consequence of the affection of the spinal marrow, are not always confined to the parts below, as might be expected, but that they take place also in those parts, which are above the ulcerated vertebræ. This is an important observation, and I have had opportunities of ascertaining it to be correct. When the disease has been situated in the middle or lower part of the back, I have not indeed known the muscles of the upper

* "Observations on the Symptoms and Treatment of Diseased Spine," &c. by Thomas Copeland.

extremities to be paralytic, but it is not uncommon under these circumstances, for pains in the arms to be connected with a paralytic affection of the legs and thighs.

I have already observed, that there is reason to believe, that suppuration takes place at an earlier period, in those cases, where the disease has its origin in the cancellous structure of the bones, than where it begins in the intervertebral cartilages. It is remarkable in some cases of this last description, to how great an extent ulceration will sometimes proceed, without the formation of abscess. I have known as many as three bodies of vertebræ completely destroyed, and the disease to have lasted many years, and yet matter has not been formed; a fortunate circumstance for the patient, as the chance of his recovery is much greater under these, than it would have been under the opposite circumstances. In whatever part of the spine the disease is situated, the ab-

scuss is likely to present itself in the upper and anterior part of the thigh ; but it may make its way in various other directions. Sometimes it takes the course of the spermatic chord, and forms a tumor projecting through the abdominal ring ; such as a superficial observer might readily mistake for a hernia. In one case, which I had an opportunity of examining after death, the abscess had penetrated into the theca vertebralis, and the whole of the spinal marrow, from its origin to its termination, was bathed in pus.

SECT. III.

On the Treatment.

FOR reasons similar to those, which prevented my entering at length into the history of the symptoms, which occur in cases of caries of the spine, I shall make but few observations on the methods of treatment, which may be employed for its re-

lief. Those, which have been principally recommended, are, first, a state of perfect quietude in the horizontal position, continued for a long period of time; and, secondly, the establishment of issues made with caustic in the neighbourhood of the affected vertebræ.

I should imagine that no one will be bold enough to deny the prudence, and that but few will deny the absolute necessity, of the first of these remedies. While the patient is in the erect position, and the weight of the head and other superincumbent parts is pressing the ulcerated surfaces one against the other, it is not likely that the progress of the ulceration can be checked, and it is highly probable that suppuration will be induced. Concerning the advantage to be derived from issues, there may perhaps be a greater difference of opinion: and I am well aware, that some of the most experienced practitioners of the present day, estimate their value at a low rate.

It is not, however, very easy to suppose that Mr. Pott, and others, whose opinion carries with it much authority, should have been mistaken so far as to persevere during a series of years, in the employment of a remedy, which was wholly inefficacious. If issues are of service, where the cartilages of the hip or knee are ulcerated, analogy would lead us to expect, that they may be useful also, where a corresponding disease has taken place in the joints of the vertebræ, and my own experience has certainly tended to confirm this expectation. I have known instances of patients, who have been under precisely the same circumstances with respect to rest, and whose symptoms have been manifestly and considerably relieved either immediately, or in a short time, after the issues had been made: and where the caustic has been occasionally applied to the surface of the issue for the purpose of keeping it open, other patients have informed me that “they have uniformly

found themselves better in a few hours after each application." At the same time it must be acknowledged, that some cases occur, in which the caustic issues seem to be productive of little or no benefit. Probably it is with diseases of the vertebral joints, as it is with those of the joints of the extremities, and issues may be useful where the original affection is an ulceration of the intervertebral cartilages, and they may be of doubtful efficacy where the morbid change of the cancellous structure of the bones precedes the ulceration. If this be correct, the difference of opinion on the subject of issues may be easily explained; and we must regret the more that we are acquainted with no better signs, by which these two varieties of disease may be distinguished in the living person.

Mr. Pott has deprecated in strong terms, the employment, in these cases, of all those instruments, and other mechanical contrivances, which have been

invented and recommended for distortions of the spine; and we cannot but believe, that any attempts to elongate and restore its figure, by forcibly separating the ulcerated surfaces of bone, which are in contact, and disposed to cohere, must be highly injurious. But it is also plain, that the disease is likely to be aggravated by the pressure of the superincumbent parts, when the patient is in the erect position; and if instruments be employed, simply for the purpose of supporting the column of the vertebræ, and taking off the weight of the head from the ulcerated surfaces, they cannot be liable to the same objections, as when they are applied with other views, and it is reasonable to expect that they may be productive of advantage to the patient. They certainly ought never to supersede, in the first instance, the constant maintenance of the horizontal posture; but I am exceedingly mistaken, if I have not seen them of much service, when the

patient has made a certain degree of progress towards recovery ; and when circumstances have made it desirable, that he should begin to sit up, during a part of the twenty-four hours.

In those cases, in which a cure is supposed to have been effected, it generally happens, that the carious vertebræ are united with each other by bony substance, which is laid on in a considerable mass on their external surface. But I have seen other cases, in which ankylosis has never taken place. The progress of the disease has been stopped ; the surfaces of the vertebræ, which had been affected, have been partially in contact, but no actual cohesion has taken place between them, and they have remained, in a certain degree, moveable on each other. Under these circumstances, an instrument judiciously applied will be useful, not only by affording support to the spine ; but also by preventing the weight, and motion of the parts above,

from exciting a recurrence of the caries. A patient, in whom there had been extensive destruction of the bodies of the dorsal vertebræ, but who had been for some years free from all symptoms of his complaint, left off an instrument, which he had been in the habit of wearing. In the course of a few months, he was seized with pains in his lower limbs, and a tumor evidently formed by a large abscess has lately presented itself in the loins, so that there is reason to believe, that his having omitted to wear the instrument has been followed by a recurrence of the original disease, in an aggravated form. In making these remarks, however, I do not mean to affirm, that the cases in which it is right to call in the aid of mechanical contrivances are of frequent occurrence, and I must repeat that they ought never to be employed for the purpose of elongating the spine, and correcting the deformity.

Whatever it is possible to do towards

attaining this last object will be effected, by the patient being made to continue for a long time, in the supine position, on a horizontal board. The curvature may perhaps, by these means, be in a slight degree diminished. At any rate, if the curvature has taken place in a child, it will be less perceptible when he is grown up. I have never seen a case, where the curvature has been very distinct, and where it has wholly disappeared; and it is not easy to believe that this can ever happen, if it be true, that portions of bone elsewhere, which have been destroyed, are never regenerated, unless the whole, or the greater part of the periosteum has remained unhurt. To the best of my knowledge, no specimens exist in anatomical museums, in which the space between the carious vertebræ has been filled up by new bone.



CHAP. VII.

ON SOME OTHER DISEASES OF THE JOINTS.

IN the present chapter it is intended to notice, in a brief manner, some other affections of the joints, which either occur more rarely than those already described, or concerning which I have but few remarks to offer, in addition to what has been said by others.

1. I have seen a very few cases, in which common inflammation had taken place in the articulating extremity of a bone, and an abscess had formed and burst into the joint. In such cases, on dissection, the bone is found possessing its natural texture and hardness, but it is of a dark colour, and usually has a foetid smell. Sometimes there is a fresh form-

ation of bony matter in consequence of inflammation and ossification of the periosteum : and this constitutes the only species of diseased joint, which has come under my own observation, in which an actual enlargement of bone has taken place. Where the soft parts of a joint are considerably thickened, a feeling is sometimes given to the hand, as if the bones themselves were increased in size, but my friend, Mr. Lawrence, some years ago observed, and pointed out that this feeling is deceptive. *

2. I have known an instance, in which, without any obvious cause, a large por-

* Since the last chapter was sent to the press, I have had an opportunity of examining a diseased spine, in which there was an extensive caries originating, as it appeared, in common inflammation of the bodies of the vertebræ. The bones retained their ordinary hardness; but were of a black colour, and although one of the intervertebral cartilages was destroyed, it was manifest from the state of the neighbouring vertebræ, that the disease had begun, not in the cartilaginous, but in the bony texture.

tion of the head of the tibia died and exfoliated, and the destruction of the knee-joint was the consequence.

Another case occurred somewhat corresponding to the last. In examining the body of a patient in the hospital, who had died labouring under an affection of the spine, I found the bodies of no less than six of the dorsal vertebræ dead, and undergoing the process of exfoliation. Five of them were entire, and the sixth was broken into several pieces. The intervertebral cartilages had wholly disappeared. The patient attributed his complaint to some unusual exertion in lifting a heavy weight.

3. The loose cartilaginous substances, which are sometimes found in the joints, have been so frequently described by writers, that I can have but few observations to offer respecting them.

I believe it is generally supposed, that these loose bodies have their origin in coagulable lymph, which has been effused from inflammation, on the inner surface of the synovial membrane, and which afterwards has become vascular. But in the majority of cases which I have met with, no symptoms of inflammation preceded their formation, and hence it is probable, that in some instances, they are generated (like other tumors) in consequence of some morbid action of a different nature.

They appear to be situated originally, either on the external surface, or in the substance of the synovial membrane, since, before they have become detached, a thin layer of the latter may be traced to be reflected over them.

My own experience is much in favour of the removal of loose cartilages by an incision of the joint, provided that this be done in a cautious and prudent manner. The patient should be kept in a

state of the most perfect quietude for two or three days preceding, and for several days after the operation. The cartilage having been well fixed, the different parts over it should be, slowly, and separately, divided until it is exposed. The wound of the synovial membrane may be dilated by means of a probe-pointed bistoury, so that it may be enough to allow of the cartilage being extracted with a tenaculum: and the cut edges of the skin should be instantly placed in contact with each other, and secured by means of adhesive plaster. I attended a gentleman, who laboured under this troublesome complaint, and in whom the loose bodies not unfrequently slipped between the articulating surfaces of the knee, occasioning an almost immediate swelling of the joint, with the most excruciating pain, and tenderness, and much symptomatic fever. In one instance, more than a month elapsed, before these symptoms had subsided. These circumstances are

noticed, because they prove, that, in this patient, there was a considerable disposition to inflammation ; yet, by attending to the precautions above mentioned, as many as five loose cartilages were extracted, by three different operations, without the slightest inconvenience from any one of them.

I have seen two cases, in which the loose bodies were of a different nature, and had a different origin, from those, which are commonly met with. It occasionally happens, that, from some morbid action, a bony ridge is formed, like a small exostosis, round the margin of the cartilaginous surfaces of the joint. In the two cases, to which I allude, this preternatural growth of bone had taken place, and in consequence of the motion of the parts on each other, portions of it had been broken off, and lay loose in the cavity of the joint.

4. I have seen one case, in which there was a large tumor of the knee, apparently belonging to that class of diseases, to which the name of *Fungus Hæmatodes* has been given by Mr. Hey, and of *Medullary Sarcoma* by Mr. Abernethy. The patient would not submit to amputation, and I had no opportunity of ascertaining after death in what texture the morbid growth originated.

CASE LIV.

5. A lady, in the year 1808, first observed a swelling in the upper part of one knee, which was unattended by pain; and which increased slowly, but uniformly. In the course of three years it had attained so inconvenient a magnitude, that the patient was induced to consent to the removal of the limb. Mr. Thomas, under whose care this lady was, performed the operation, and allowed me afterwards to examine the amputated joint.

The tumor occupied the upper part of the knee, beginning at the edge of the cartilaginous surface, and extending about three or four inches up the lower part of the thigh. It was interposed between the muscles and the bone of the thigh, so that the former were seen expanded over it. It was of a greyish white colour; composed of fibres of a gristly semitransparent substance, with osseous matter intermixed with it, and about two inches in thickness on each side of the femur. At the upper part it was seen distinctly originating in the periosteum; at the lower part, the periosteum could not be traced, and the structure of the bone was continued into that of the tumor. The cartilages and ligaments of the joint were free from disease. On the external surface of the synovial membrane, unconnected with the diseased structure above, there were three or four flattened bodies, each of about the size of a kidney bean, of a white colour, and

of a texture somewhat softer than that of cartilage. The synovial membrane itself was free from disease.

There can be no doubt that in this case, the original disease was the osteosarcomatous tumor, originating in the periosteum of the femur. The circumstance of the other tumors being found connected with the synovial membrane, although the intermediate parts were, to all appearance, in a healthy state, is remarkable, but something corresponding to this may be observed in other diseases. For example, when a scirrhus has formed in the gland of the breast, it is not unusual to find small tubercles of a similar structure in the skin over it, at various distances from each other, although the intermediate adipose substance, as well as the portions of skin between the tubercles themselves, exhibit no marks of disease.

I met with another case, in which the patient appeared to labour under an enormous tumor of the hip. It was as-

certained by dissection, that the hip itself was free from disease, and that the enlargement was formed by an osteo-sarcomatous growth from the periosteum of the upper extremity of the femur. *

6. The effects of gout on the joints are very remarkable. The cartilages are absorbed; the exposed surfaces of bone are partially, or entirely, encrusted with a white earthy matter, which I conclude to be urate of soda; and sometimes they have the appearance of being formed into grooves, as if they had been worn by their friction on each other. In some cases repeated, and long-continued attacks of gout occasion complete ankylosis.

* Mr. Russel in his "Treatise on the Morbid Affections of the Knee," has given an account of what he terms "an *uncommon disease*" of this joint. If I am not mistaken, whoever peruses the history, which Mr. Russel has given, will be of opinion that *some* of the cases, from which he has drawn his observations, were of a similar nature to those, which are described above.

CHAP. VIII.

ON INFLAMMATION OF THE BURSÆ MUCOSÆ. *

SECT. I.

History and Symptoms of this Disease.

THE synovial membranes, which constitute the bursæ mucosæ, very nearly resemble in their structure and functions, those which line the articular cavities; and hence, it must be considered as a remarkable circumstance, that the former should not be subject to that peculiar

* I include, under this head, the membranes forming the sheaths of the tendons, which have the same structure, answer a similar purpose, and cannot, with propriety, be distinguished from the other bursæ. I adopt the name of *bursæ mucosæ*, because it is in general use, although it ill expresses the functions of the organs to which it is applied.

morbid alteration of structure, which occurs in the latter, and which has been described in another part of this volume.

Inflammation of the *bursæ mucosæ* is marked by nearly the same characters, and (allowance being made for the difference of the parts, with which they are connected) produces nearly the same results with inflammation of the synovial membranes of the joints. In the greater number of instances it occasions an increased secretion of synovia. In other cases, the bursa is distended by a somewhat turbid serum, with portions of coagulable lymph floating in it. Occasionally it terminates in the formation of abscess. Sometimes the membrane of the bursa becomes thickened, and converted into a gristly substance. I have seen it at least half an inch in thickness, with a small cellular cavity in the centre containing synovia. At other times, although the inflammation has continued for a very long period, the

membrane of the bursa retains its original structure.

Inflammation of the bursæ mucosæ may be the consequence of pressure, or of other local injury. It may arise from the too great use of mercury, from rheumatism, or from some other constitutional affection: and in such cases it is frequently combined with inflammation of the synovial membranes of the joints. Sometimes it has the form of an acute, but more frequently it has that of a chronic inflammation.

The inflamed bursa forms a tumor, more or less distinct, according to its situation; more or less painful, according to the character of the inflammation. If the bursa be superficial, the fluctuation of fluid within it, is, in the first instance, very perceptible: and, under these circumstances, if the inflammation be considerable, it extends to the surrounding parts, and occasions a redness of the skin. When the disease has

existed for a certain period of time, it generally happens, that the fluid is less distinctly to be felt on account of the membrane having become thickened; and, occasionally, this takes place to such an extent, that the tumor exhibits all the characters of a hard solid substance, of which the fluid contents are imperceptible.

When the inflammation is of long standing, it is not unusual to find floating in the fluid of the bursa a number of loose bodies, of a flattened oval form, of a light brown colour, with smooth surfaces, resembling small melon seeds in appearance. There seems to be no doubt that these loose bodies have their origin in the coagulable lymph, which was effused in the early stage of the disease: and I have had opportunities, by the examination of several cases, to trace the steps of their gradual formation. At first the coagulable lymph forms irregular masses of no determined shape:

afterwards by the motion and pressure of the contiguous parts, it is broken down into smaller portions. These, by degrees, become of a regular form, and assume a firmer consistence: and at last they terminate in the flat oval bodies, which have been just described.

When inflammation of a bursa mucosa ends in suppuration, the abscess sometimes makes its way directly to the surface of the skin, and bursts externally: but I suspect, that in other cases the matter in the first instance escapes into the surrounding cellular membrane, and then it is liable to be confounded with those abscesses, which originate in this texture. The following circumstances seem to warrant this opinion. There is no bursa more liable to be inflamed than that, between the patella and the skin, and inflammation of it not unfrequently terminates in suppuration, as I have ascertained to be the case, both by the discharge of pus, when the tumor has

been punctured, and by dissection after death. It is very common to find a large abscess on the anterior part of the knee, which the patient describes as having commenced over the centre of the patella, in the situation of this bursa. The abscess has a somewhat peculiar character. It raises the skin from the patella, so that the latter cannot be felt, and from this point, as from a centre, it extends itself between the skin and the fascia, equally in every direction, covering the whole of the anterior part of the knee. A superficial observer, judging from the general form of the tumor, and the fluctuation of fluid, without noticing the greater redness of the skin, and the circumstance of the fluid being over, instead of under, the patella, might mistake the case for one of inflammation of the synovial membrane of the joint itself. Such an abscess must be supposed to commence either in the bursa above

mentioned, or in the cellular texture. The original situation of the disease corresponds to that of the bursa: there appears to be no reason why an abscess of the cellular texture should occur in this precise spot, more frequently than elsewhere; and hence it is reasonable to conclude, that the bursa is the part in which the abscess begins. It is not improbable that many other abscesses of the extremities may have a similar origin. The tumor, which occurs in the inside of the ball of the great toe, and, which is one of those, to which the name of bunyon has been applied, occasionally suppurates; and I have found on dissection, that this is formed by an inflammation of the bursa, which is here situated.

It frequently happens, after the inflammation has entirely subsided, that the disposition to secrete a preternatural quantity of fluid still remains, and that a dropsy of the bursa is the consequence,

in like manner as hydrocele takes place in some cases, as a consequence of inflammation of the tunica vaginalis of the testicle. Such a tumor when once formed, may continue unaltered for many months, or even for years, and the majority of ganglions are of this description.

SECT. II.

On the Treatment.

IN the first instance, leeches and cold lotions, and afterward, blisters or stimulating liniments may be employed with advantage; and in particular cases these may be combined with such constitutional remedies, as their peculiar circumstances seem to indicate. Under this treatment the inflammation of the bursa will be relieved without difficulty, and in the early stage of the disease, the fluid, which has been effused will become absorbed.

But where the disease has been long

established, the preternatural secretion of fluid will often continue after the inflammation has entirely subsided. Under these circumstances, if blisters fail in procuring its absorption, friction may be employed, and if this is not attended with better effects, it will be advisable that the fluid should be evacuated by puncture. In many cases the loose bodies, which have been described in the last section, are found in the cavity of the bursa, and these extraneous substances may in themselves be sufficient to keep up the formation of fluid.

I have observed, where the puncture of the tumor is followed by suppuration, and the whole cavity of the bursa is thus converted into an abscess, that, after the suppuration has ceased, no further collection of fluid in general takes place, and there is a permanent cure of the disease. Hence I have sometimes been induced, after using the lancet, to bring on suppuration by artificial means. This

may be effected, by introducing a seton or tent into the wound, or (which is more simple, and in all respects preferable) by irritating the inner surface of the bursa with the blunt end of a probe. Even where the bursa forms the sheath of one or more tendons, this method may be employed with safety, though the success of it is more uncertain, on account of the greater part of the membrane being beyond the reach of the operation.

I do not mean, however, to affirm that the above practice should be extended to all cases indiscriminately. Inflammation and suppuration of a large bursa sometimes disturbs the constitution in so great a degree, that it may be doubtful, whether it would be prudent, in this instance, to do more than simply puncture the tumor, keeping the patient in a state of perfect quietude afterwards. A large swelling, formed by a cyst distended with serum only, or with serum

and masses of coagulable lymph floating in it, occasionally is met with over the inferior angle of the scapula ; originating, as I apprehend, in the large bursa mucosa which is interposed at this part between the scapula and the latissimus dorsi muscle. I had an opportunity of seeing a tumor of this description, which had attained a magnitude not much less than that of a man's head. I understood that the cyst was afterwards punctured and a seton passed through its cavity, and that so much disturbance of the general system ensued, as to occasion death. I have seen another case, in which death took place in a short time after such a tumor was punctured, but here the patient was otherwise in bad health, and that strict attention was not paid to his being kept in a state of quietude after the operation, which the circumstances seem to have required. I shall give an account of a more fortunate case of the same kind hereafter.

When the coats of the bursa have become much thickened, I am not aware that there is any method, by which they can be restored to their natural condition. If the diseased bursa be situated superficially, it may be removed with as much facility as an encysted tumor. I have never indeed performed this operation myself, nor have I heard of it being done by others, except on the bursa, which is situated between the patella and the skin ; but there can be no doubt that there are some other superficial bursæ, to which the operation would be equally applicable if occasion called for it. On the other hand, where the bursa envelopes tendons, or where it is deep-seated, the operation must be impracticable ; and where the bursa communicates with the cavity of a joint, if practicable, it must be improper.

In those cases, where the bursa over the patella has been extirpated, I do not know that the patient has afterwards suf-

ferred any inconvenience from the want of it. It is not improbable that a new bursa may ultimately be formed to supply the place of that, which has been taken away. A synovial membrane is of simple structure. It may be resolved by maceration into cellular texture, and instances are not wanting of new synovial membranes being formed where none before existed. Such is the case in an artificial joint after an ununited fracture. In a young lady, who has attained the age of ten or twelve years, labouring under the inconvenience of a club foot, a large bursa is distinctly to be felt on that part of the instep on which she treads.

In another young lady, who has apparently recovered of a caries of the spine, attended with a considerable angular curvature, a bursa appears to have been formed between the projecting spinous process, and the skin.

SECT. III.

Cases of this Disease.

CASE LV.

MARY NEWNHAM, twenty-two years of age, was admitted into St. George's Hospital, having the bursa over the right patella enlarged to the size of a small orange. It contained fluid, and the membrane of the bursa appeared to be very little thickened. At this time she experienced no pain, and there was no inconvenience, except what arose from the bulk of the tumor.

Blisters having been applied, and other methods having been employed with a view to promote the absorption of fluid without success, I made a puncture with a lancet, and more than an ounce of serous fluid escaped. I then introduced the blunt end of a probe, and irritated the inner surface of the bursa ; in conse-

quence of which, on the following day, there was some degree of pain and swelling, with a slight symptomatic fever. On the fourth day after the operation, on removing the dressings, about half an ounce of pus was discharged. The supuration continued, but the quantity of pus daily diminished, and, at the end of three weeks, the wound was healed, and the tumor had wholly disappeared.

CASE LVI.

Mrs. T., between twenty and thirty years of age, in the middle of March, 1818, first observed a tumor situated over the inferior angle of one scapula, and attended with a trifling degree of pain and tenderness. In the course of a week, the tumor had attained its greatest magnitude, and then remained stationary. In the following April, when she came under my care, the tumor was of the size of a large cocoa-nut; of an oval

shape ; distinctly circumscribed ; occupying the place of the large bursa mucosa, which is situated between the latissimus dorsi muscle and the inferior angle of the scapula.

On the 22d of May, the tumor being nearly in the same condition, I made a puncture with an abscess lancet, and about a pint of turbid serum was evacuated, with some irregularly shaped masses of coagulable lymph floating in it. Adhesive plaster was placed over the wound, and secured by a compress and bandage : and she was desired to remain perfectly quiet in bed. The wound did not heal by the first intention, and, on removing the dressings at the end of four days, a considerable quantity of pus escaped. The discharge of pus continued, but the quantity daily diminished, no untoward symptoms took place, but nearly three months elapsed before the suppuration had entirely ceased, and the wound had healed. At this time there were no re-

mains of the tumor, and she was in all respects well.

CASE LVII.

A. B., a middle-aged woman, became a patient of St. George's Hospital under Mr. R. Keate, on account of a tumor on the back part of the wrist, of the size of a double walnut, containing fluid; and which had been the consequence of inflammation of the bursa mucosa, which envelopes the extensor tendons of the fingers. At the time of her coming to the hospital the inflammation had entirely subsided, and the tumor occasioned no inconvenience, except what might be attributed to its bulk. After having employed various local remedies without any reduction of the swelling, a puncture was made, and a considerable quantity of serous fluid was evacuated. In a short time however the fluid was again collected in as large a quan-

tity as before. Afterwards Mr. R. Keate made a longitudinal incision in the skin over the tumor, and dissected out as much as possible of the bursa, leaving only that part of it which enveloped the tendons. The wound suppurated, and healed gradually, and at first it was supposed that the operation had produced a cure. But in a few weeks after the wound had cicatrized, the tumor reappeared, having the same character as before, but being of not more than one half of its former size: and when I last saw the patient, it continued in the same state.

CASE LVIII.

Ruth Target was admitted into St. George's Hospital, in August, 1809, on account of a hard and apparently solid tumor, of the size of a small orange, situated between the patella and the skin, and perfectly moveable on the parts below.

Having made a longitudinal incision of the integuments I removed the tumor with perfect facility. A slight degree of symptomatic fever followed the operation, which however speedily subsided, and at the end of a month, she was discharged as cured, suffering no inconvenience except a very trifling sense of stiffness, when she walked.

On examining the tumor, after its removal, it was found to be formed by the bursa, which is situated over the patella; the parietes of which had become more than half an inch in thickness, and of a ligamentous texture; while the interior retained its natural cellular structure, and was filled with a serous fluid.

I have lately performed a similar operation on another patient. After the wound was healed, there was at first considerable stiffness of the knee, in consequence of the cicatrix having formed a

close attachment to the anterior surface of the patella; but at this time, three months from the day of the operation, the skin has become so moveable on the parts below, that there is every reason to believe that a new bursa may be generated to supply the place of the old one.

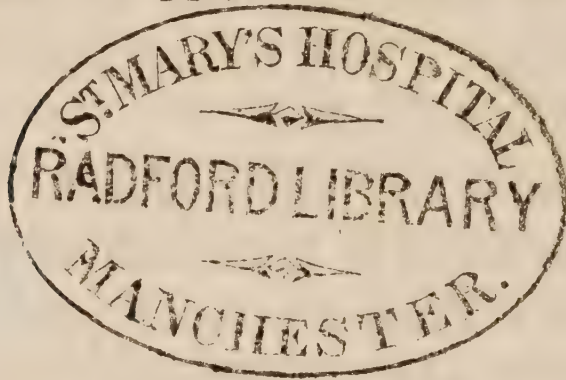




Fig. 1.

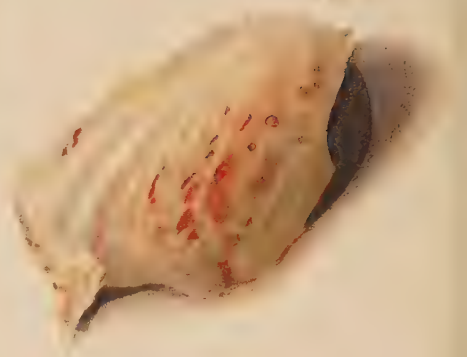


Fig. 2.

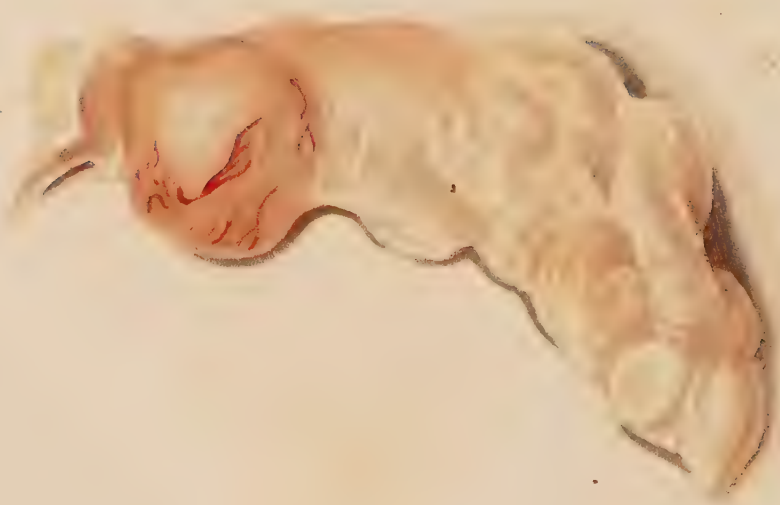
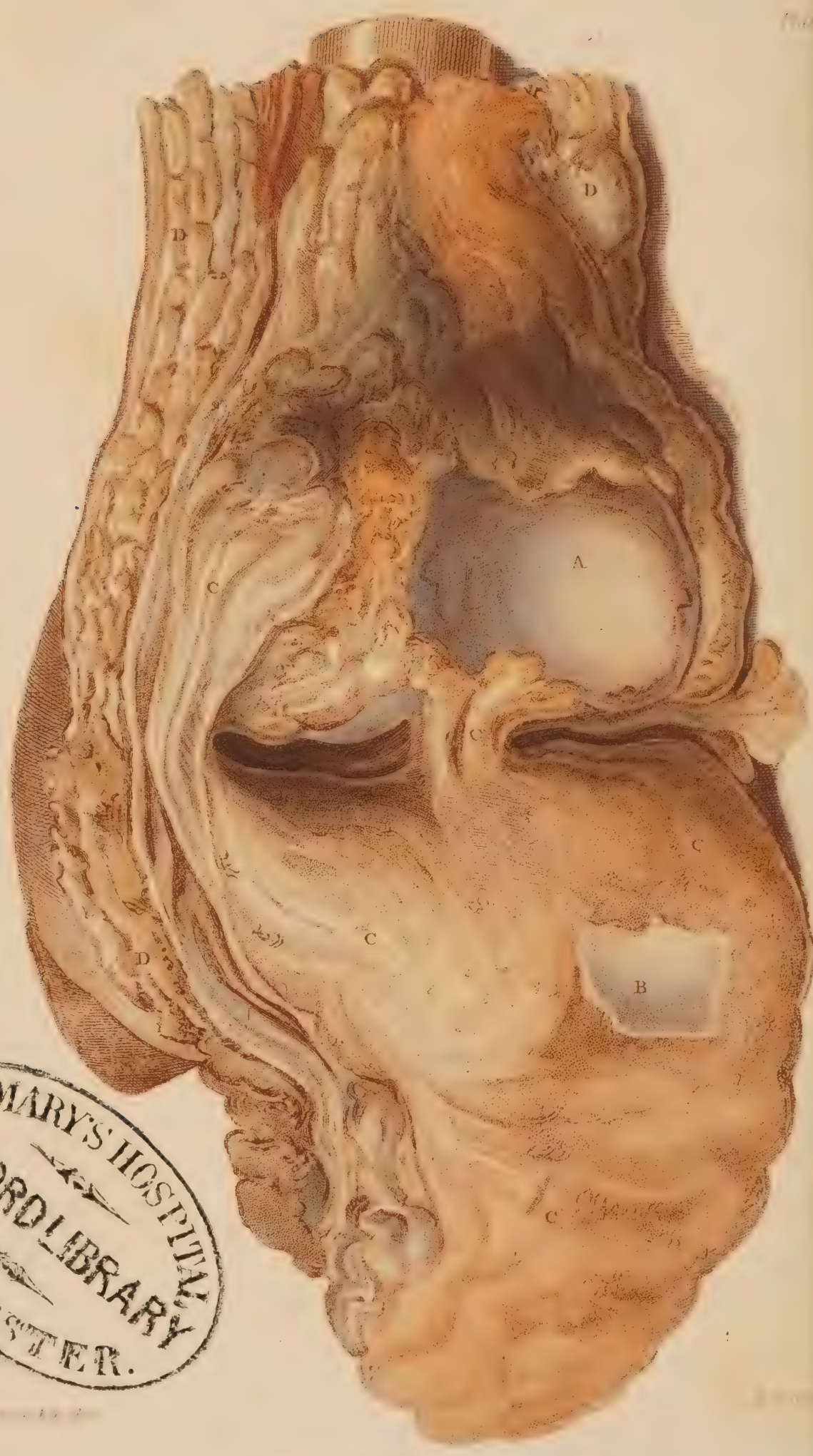


Fig. 3.

J. Howship del. Fig. 1. J.S. Gaskin del. 2 & 3.



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EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. A part of the synovial membrane of the knee in a state of inflammation, and lined with coagulable lymph. This is introduced, principally, with a view to the appearances being contrasted with those in

Fig. 2. and fig. 3. which represent the cut surfaces of two small portions of a synovial membrane, which had undergone the peculiar morbid alteration of structure, which has been described in the third chapter.

PLATE II.

A knee-joint, the synovial membrane of which had undergone the same alteration of structure. In order to make the drawing, the joint was cut into at its

upper and lateral parts, and the anterior portion of the synovial membrane was turned downwards, so as to expose the internal surface.

A, The cartilage covering the condyles of the femur.

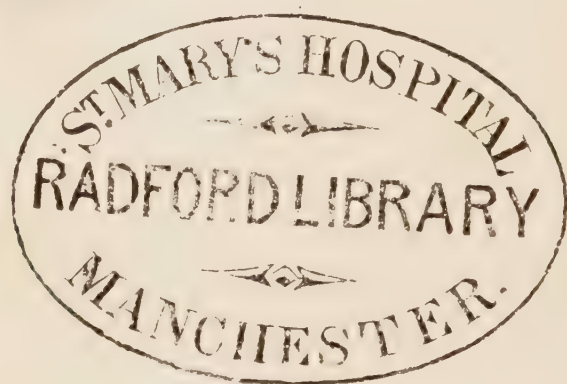
B, The cartilage lining the patella.

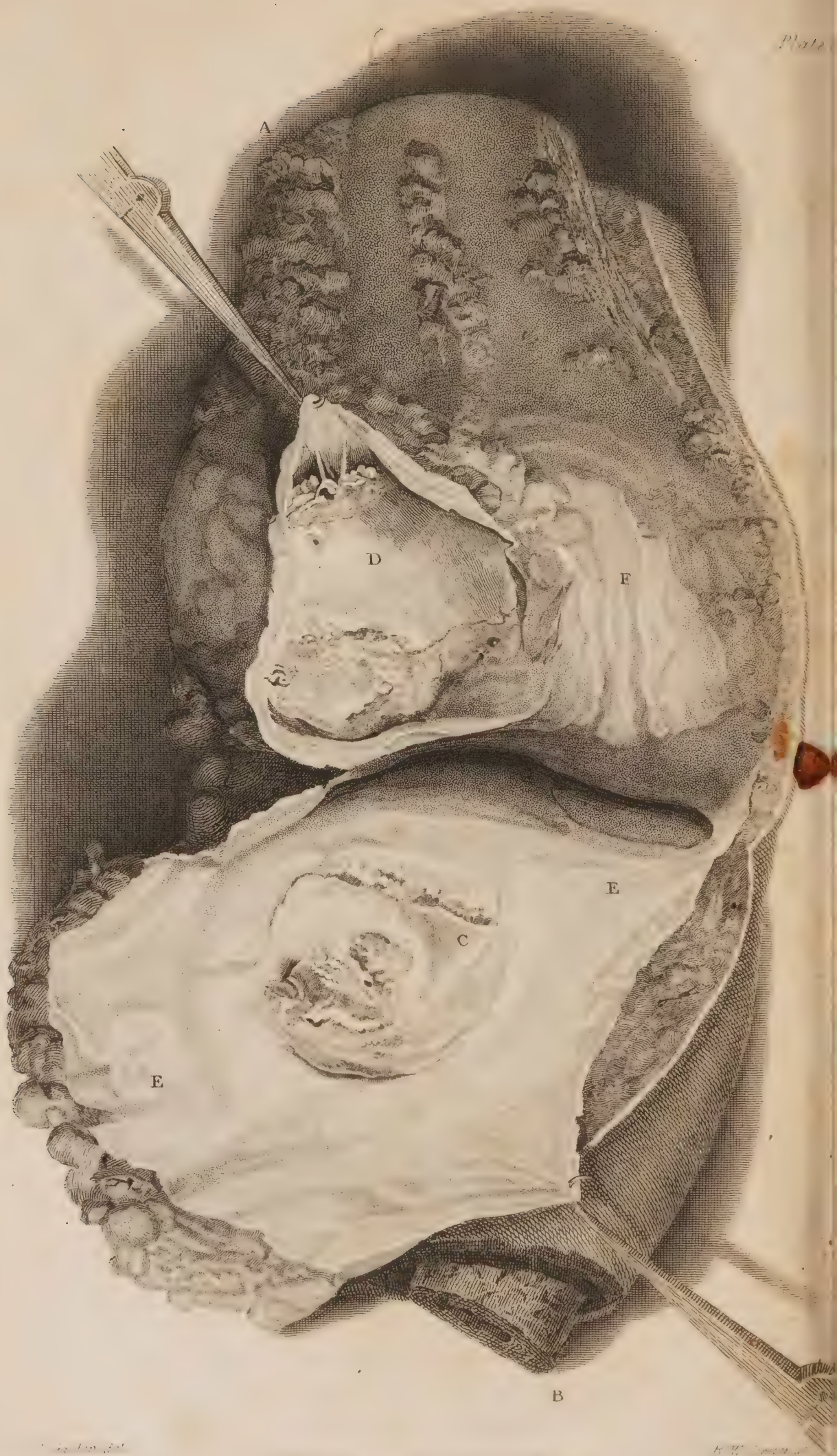
C C C, The inner surface of the diseased synovial membrane.

D D, The cut surfaces of the skin and adipose substance.

PLATE III.

The joint of the hip, affected with ulceration of the cartilage, from a child seven years old. The greater part of the synovial membrane and capsular ligament have been removed, so as to expose more completely the interior of the joint. The round ligament, (which was partly destroyed by ulceration, where it was connected to the acetabulum) has been torn through, so as to allow of the head of the femur being dislocated.





- A, A portion of the os innominatum.
- B, The head of the femur.
- C, The acetabulum.
- D, The inner surface of the synovial membrane in a natural state.
- E, Portions of the bone of the acetabulum exposed, in consequence of the cartilage having been ulcerated.
- F, A portion of the cartilage covering the head of the femur converted into a fibrous substance.
- G, The great trochanter.

PLATE IV.

The knee-joint affected with ulceration of the cartilages. The interior of it is exposed in the same manner as in Plate II.

- A, The femur.
- B, The tibia.
- C, The inner surface of the patella, the cartilage of which has been in great measure destroyed by ulceration.
- D, The surface of the external con-

dyle of the femur, the cartilage of which is partially ulcerated also.

E, The inner surface of the synovial membrane in a natural state.

F, The inner condyle of the femur covered by a substance resembling that of adhesions.

PLATE V.

A portion of the carious spine of a child, to shew the disease originating in the intervertebral cartilages.

A, The seat of the curvature, where the bodies of two vertebræ have been destroyed.

B, C, The spaces formed by the absorption of the intervertebral cartilages, while the bones have been left entire.

PLATE VI.

The preparation, from which this drawing was taken, is in Mr. Heavyside's collection. The history of the case is not known, but the appearances are

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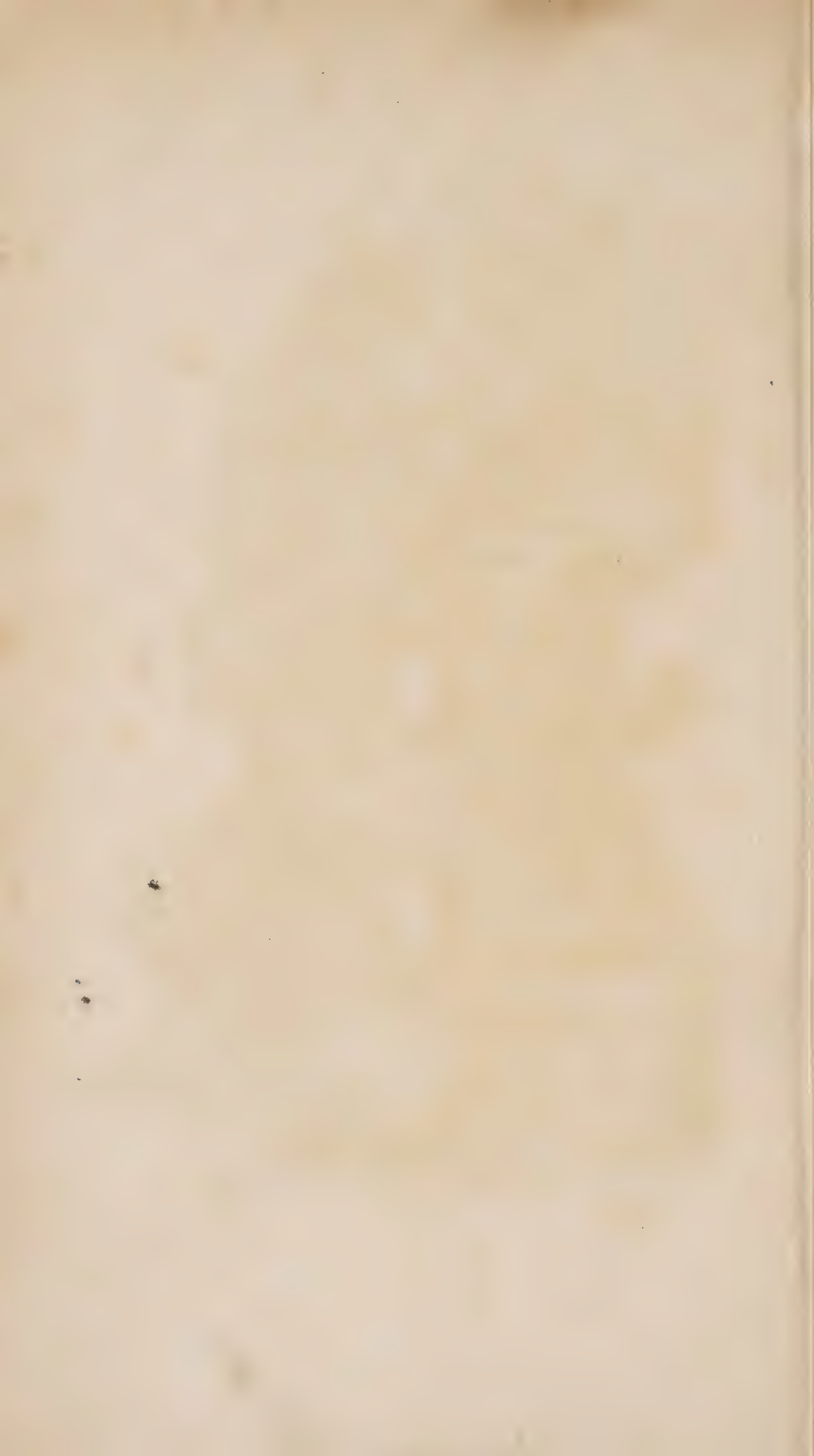


J. Howship, del

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precisely similar to those, which I have observed in other cases, in which caries of the spine has been induced by the pressure of a tumor situated externally to it. This figure is introduced, chiefly, for the purpose of it being contrasted with the figure in the last plate.

A, C, The bodies of the vertebræ destroyed to a considerable extent, while the intervertebral cartilage between them, B, remains entire.

For the greater number of the drawings from which these plates were taken, I am indebted to the kindness of Mr. Howship and Mr. Gaskoin, whose anatomical knowledge have enabled them to express the various morbid appearances with peculiar accuracy.

THE END.

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